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TEA CHESTS.

THE complaint made by more than one of the most prominent among the London tea brokers, to the effect that recent arrivals of Ceylon tea had been greatly injured by having been packed in boxes made of unseasoned wood, is one of particular gravity. It is one, indeed, to which the most serious attention of our planters should be directetd : for if its cause be not removed it is likely to have a very injurious effect upon the reputation which our staple produce has now acquired.

For some years past the difficulty of obtaining in sufficient quantity thoroughly seasoned and otherwise adapted wood for the manufacture of tea chests has been generally acknowledged With the extension of tea cultivation this difficulty is certain to increase, and equally certain is it—if only to judge by the complaints to which we have drawn attention—that even with the present demand it has not at this date been fully met and overcome. The question we may well ask ourselves is, whether there is any present prospect of a greater measure of success being attained in this direction? Many localities, both in and out of the island, have been searched in the hope of finding some solution of the difficulty, but hitherto these can scarcely be said to have afforded full satisfaction, except, perhaps, in the supplies from Japan. To be told that some of our teas reach London so impregnated with a "cheesy" flavour that they have to be turned out, thoroughly aired, and re-packed in fresh chests, is a most unpleasant revelation. We are all aware how our delicate teas must suffer from being submitted to such an operation, and we cannot fail to realize how injurious to their high repute must be its consequences. Very recently, when referring to the Stanley-Wrightson chests, our London Correspondent informed us of a prospect that the strawboard of which these are made might ultimately be prepared from horse manure. Thereupon Mr. Creasy, in a letter which appeared in our columns, indulged in a plenitude of "epitaphs"—to plagiarize Mrs. Malaprop—in condemnation of such use; but we doubt much whether, even if that gentleman's anticipations of evil and tainting smells to be expected from the use of a material so produced be realized, these could be worse than those due to the exudation of acids from unseasoned wood. In the latter case, it is not bad aroma alone that has to be feared, but the action of these acids upon the lead which is supposed to exclude the tea from the tainting effect of it.

It seems to be certain, that, if those who have endeavoured to serve our island interests in this matter of tea chests, from local resources, fail so far in their object as to leave it open for coumplaints of the nature stated to be made,—our planters will have to turn their thoughts to some substitute for wood. We hesitate to say as yet how far the new chests supplied by the Stanley-Wrightson Syndicate may be found fitted to take the place of the wooden ones at present used. These chests are as yet upon their trial, and so far the trial is only in its incipien stage. A few months, probably, will either reveal their superiority or condemn them as furnishing an alternative for escape from our present difficulty. Trial shipments have already reached the island, and our London Letter informs us that the manufactures are delaying the further development of their present limited means for the production of the chests until the verdict of tea planters and shippers and of the home tea trade should be fully given. It is but natural that we ourselves, being informed of this hesitation on the part of the Syndicate, should refrain from expressing any opinion with regard to the merits of this invention as affording a solution to this importan question.

But there is one aspect in which we might well desire to express the hope that these Stanley-Wright

son chests may prove to be all that is claimed for them, quite apart from that in which our planters may regard the matter. Should it ultimately be found desirable to supersede the wooden boxes at present in use by this novel alternative, the decision may open to us another very valuable island industry, and much money which now goes out of Ceylon to pay for foreign woods and Japanese boxes may be retained in it to the great benefit of its community. It is known that the Syndicate working the patent for these chests looks forward hopefully to eventually conducting their manufacture locally. Ceylon, as does every other tropical country, possesses an abundance of almost wild growth which by means of modern machinery may readily be prepared for the production of this strawboard. We have before dealt with the prospect which is thus held out to us, and we need not therefore here further dilate upon it. But the complaint now reaching us brings this prospect nearer to us. It may be found that in its realization may lie the only road out of the difficulties which have given rise to that complaint. We would therefore express the hope that those of our friends who may now be making trial of the Stanley-Wrightson chests will favour us with as early information as to the results to their experience with them as may be practicable. We cannot fail to appreciate any new device by which the causes for the complaints we have dealt with may soon be removed. We shall deal with the good news of the successful utilisation of Maana grass reported by this mail, on another page.

THE PLANTING INDUSTRY OF THE COLONY (CEYLON) IN JUNE 1890.

The main results can now be given of the compilation of plantation statistics for our "Handbook and Directory," thus:—

Number of separate properties recorded	..1,930
Number of plantations cultivated ..	..1,452
Number of Superintendents and Assistants	..1,211

Total extent ..	..686,728	acres.
„ cultivated ..	..324,765	„
In TEA	..219,487	„
„ COFFEE (Arabian)	.. 53,454	„
„ „ (Liberian)	.. 1,226	„
„ CACAO ..	.. 12,050	„
„ CARDAMOMS ..	.. 5,060	„
„ COTTON (on plantations)..	293	„
„ TOBACCO „ ..	477	„
„ RUBBER „ ..	678	„
„ PEPPER „ ..	215	„
„ ARNATTO „ ..	419	„
„ TIMBER AND FUEL TREES PLANTED ..	.. 1,589	„

In CINCHONA,—19,677,000 trees over two years old.

This last piece of information may appear rather startling to those who have been crying out that there is no cinchona left in the country; but the figures really mean that 16 millions of cinchona trees have been cut down and uprooted since July 1888—no bad rate of harvesting. We have already dealt with tea. Poor old coffee has run out by 25,000 acres in the two years and what a change since 1877—thirteen years ago only—when coffee stood for 272,243 acres! Liberian coffee and cacao show little change; but the area under cardamoms has slightly increased. Of the minor products, there is no need that we should speak today. But it is interesting to note that while the total number of plantations cultivated has not increased (a number of old places "abandoned"), but is rather less, the total number of planters has gone up from 1,136 to 1,211 in the two years. Our highest number was 1,389 in February 1881, and then it went down to 1,079 in December 1885. In rather more than four years therefore, we have gained 132 additions to the list of managers and assistant superintendents or at the rate of 34 per annum.

IMMIGRANT AND NATIVE LABOUR IN JAMAICA.

The negroes and their friends in Jamaica have generally opposed immigration at the cost of the State on the ground that native labour is abundant and would be available for the planters if they gave equal wages and advantages to natives as to immigrants. The complaint of employers in Jamaica is in regard to negroes the same as in Ceylon is preferred against the Sinhalese,—unreliability: the absence of steady perseverance in work. The report of a recent committee on immigration seems to have dealt very fully with the whole question, as the following extracts prove:—

That they have duly considered the Messages of His Excellency the Governor and the several Petitions relating to Immigration and have heard all witnesses who have tendered their evidence on the subject.

They accept the statement that in many Districts of the Island there is an absence of that supply of continuous and reliable labour which is indispensable to secure the investment of capital and the development of the great resources of the Island.

Your Committee are of opinion that for the encouragement of the investment of capital on agricultural operations, a certainty of continuous labor is a necessity, and that in a country so sparsely populated as this is the establishment of a system by which such labour can be secured on fair terms to the employer and employed must work greatly to general prosperity. They attach considerable importance to the assertion of those who oppose Immigration that if the same facilities, terms and advantages now given to imported labourers are given to native labourers, the uncertainty now attending the supply of labour would be lessened. They therefore recommend that power should be granted to the Protector of Immigrants to enter into contracts with native labourers on behalf of employers and that only a sufficient number of imported labourers should be introduced as will with the native contract labourers meet the wants of employers. To encourage the native labourer to work under the protection of the Immigration Department your Committee recommend that an indenture fee of 50s a year for each native adult labourer entering into an annual contract should be paid to the Executive by each employer and that of this sum £2 should be paid as a bonus to the native labourer on the expiry of each year's faithful service under contract, and the remaining 10s should be available to yards reimbursing the Government the cost of carrying out the system. This would give the native contract labourer an advantage over any imported labourer.

They further recommend that no employer should be supplied with imported labourers who refuses to receive such contract labourers (native or second term Coolies) as the Protector is able to allot to him, or who after receiving, breaks his contract to them.

Your Committee are of opinion that as priority of employment would, under the system they recommend, always be given to native labourers who are willing to work under annual contracts which the Government would be responsible to see duly carried out as well by the labourer as by the employer, the public interest requires that any deficiency in the supply of labour necessary for the continuance or development of agricultural operation should be met by importing a sufficient number of labourers from elsewhere.

It must be borne in mind that if by the arrangement suggested there be a sufficiency of native labourers, willing to work under Government Supervision on yearly contracts—so as to ensure to capital a reliable supply of labour—no imported labourers will be required or introduced and that if enterprise and capital are driven away from Jamaica, because neither native nor imported labour is obtainable, it will be not only impossible for the Colony to advance but on the contrary it will retrograde.

Your Committee do not think there is any question of competition between the native and imported labourer because they cannot believe that an employer will ever resort to the employment of imported labourers if he can obtain reliable native labour.

Your Committee in closing their Report call attention to the fact that if it be, as maintained by many a ainst the assertion of others, that there is a sufficiency of native labour, and if that labour will declare it elf and avail itself of the machinery afforded by these suggestions general prosperity will be secured at no cost to the State beyond the maintenance of the Immigration Department for the benefit of native labourers.

One member of the committee in a separate statement said :—

Individually, I go beyond its recommendations and would urge upon the Government the necessity for taking immediate steps to meet the demand for labour not only on Estates—which now exists—but the demand which, in my opinion is certain to arise in carrying out the very extensive public works already decided on, and in contemplation and which must to a great extent deplete the present supply of agricultural labour. I also think that the Government ought to offer inducements to skilled laborers and tradesmen to settle in the Island who could teach their handicrafts (now nearly extinct) to the rising generation under a proper system of apprenticeship.

In my opinion it is idle to assert that native labour is now available on the terms given to the Coolie immigrant. Employers cannot expect to control continuous native labour—even on ruinous terms—while the labourer can become a freeholder with a facility unsurpassed anywhere and there are other well known reasons which account for the decreasing supply of labour, notably, the smattering of elementary education given to our youth, which has the tendency in the present transitional condition of the bulk of the population to disqualify them for field or other manual work.

DOMESTIC GEMS AND PRECIOUS STONES.

The following is from the New York *Sun* : "While it is a fact that nearly all the precious stones are to be found in the United States, the deposit of most of the varieties, so far as we know, are too meagre to warrant the application of capital and systematic labor to their production. In two States only, Maine and North Carolina, has a systematic search for gems been carried on. Of diamonds, for instance, 95 per cent. of the current supply comes from the Kimberly mines of South Africa. Over nine tons of diamonds, valued after cutting at $500,000,000, have been taken from those mines since their discovery in 1867. The South African mines are all contained within a radius of a mile and a half. The deposit is concentrated and its working profitable. Since Brazil, India and Borneo are to be included among the contributors of the remaing 5 per cent. of the world's diamond supply, it will be seen that the share of the United States as a producer is hardly recognizable. A few years ago a very lively hope was started of the existence of diamond fields in Kentucky. It was based upon a striking resemblance between certain earthy formations in Kentucky and those at the Kimberly mines. Theoretically, there is strong reason to believe in a Kentucky diamond bed, but the theory has not yet developed into fact. Less reason but a more brilliant plausibility was given to the promise of a diamond mine in Arizona some twenty years ago. Representations were made in San Francisco of the discovery of an immense treasure of diamonds and rubies in one of the neighboring territories. In confirmation there were exhibited so called rubies amounting to 80,000 carats, and numerous diamonds, one of 108 carats weight. The stones were deposited in the Bank of California, and the news spread across the continent. Capitalists became interested. A bill in the interest of diamond miners was passed in Congress. A great combination party from the east and from the west went prospecting. They carried along an expert from the Royal School of Mines, in Freiburg. They found the promised spot. Everybody picked up gems. In a week the party secured 1,000 carats of diamonds and something like 7,000 carats of rubies. Then Mr. Clarence King, director of the United States Geological Survey, went out and proved that the mine had been 'salted.' The rubies were shown to be ordinary garnets, and the 108-carat diamond a piece of quartz. Part of the salting had been done with a large quantity of rough diamonds bought by an unnamed American in London. The swindlers made by their venture $750,000, the greater part of which was contributed by California capitalists. Of corundum, the mineral which, in some of its varieties, bears the names ruby, sapphire, Oriental amethyst, Oriental emerald and Oriental topaz, we have some specimens, but the country is not rich in stones of this order. The North Carolina corundum excels in variety of color. Many specimens have been cut and mounted, especially of the blue and red shades, and make good gems, though not of the choicer quality. The chief locality for gem sapphires in the United States is near Helena, Mont., where they occur as loose crystals, usually small but often transparent and of good colour. Turquoise we get from New Mexico, Arizona, Nevada, Colorado and California."—*Bradstreet's*, 10th May.

NOTES ON POPULAR SCIENCE.

BY DR. J. E. TAYLOR, F.G.S., F.L.S., &C.,

Editor of *Science Gossip*.

SUGAR-CANE.—A most interesting and highly important paper was read before the Linnean Society in March by Mr. D. Morris. Mr. Morris is one of the younger school of botanists, and is well-known for his extensive knowledge of economic botany, for which his training in Jamaica has well fitted him. He is now assistant director at Kew, and it is there he has made the discovery announced in the paper above referred to. It is concerning the growth and development of the sugar-cane. Hitherto the plan has been to propagate it by slips or cuttings and few planters knew or cared anything about the seeds. Mr. Morris had succeeded in obtaining seeds from the sugar-cane, and he believes he can

raise from them a great variety of improved canes. He showed by cross-fertilisation and artificial selection of the best seeds a richer sugar-yielding cane might be produced for growth in tropical plantations.—*Australasian.*

COFFEE AND COCOA TRADES SECTION:—LONDON CHAMBER OF COMMERCE.

The annual meeting of the members of the Coffee and Cocoa Trades Section of the London Chamber of Commerce was held on Monday afternoon at the offices, Botolph House, Eastcheap, E.C., Mr. Robert Wales presiding.

The Coffee Committee was re-elected, with Mr. Game in place of Mr. Larner, deceased, and Mr. H. Flower (of Messrs. J. Cook & Co.) in place of Mr. Major, also deceased. The Cocoa Committee remained as before, and the president and vice-president of the Section were also re-elected.

Mr. RUCKER then brought forward the question of the liability of fire insurance offices to the merchant and thence to the broker, who may have advanced money on the sale previous to prompt, and it was decided to fully discuss the matter at a future meeting, notice of which should be given.

It was further decided to accept the offer made on the part of Mr. Pasteur of a paper on the interesting subject of "Coffee Cultivation in Bechuanaland and Natal." It was stated that the paper would be read about the middle of June, on a date to be selected by Mr. Pasteur himself.

This concluding the business, a vote of thanks to the Chairman was carried, on the motion of Mr. W. W. ASSER, seconded by Mr. E. A. RUCKER.—*Grocer*, May 24th.

HOW PERFUMES ARE MADE.

Those dainty, delicate perfumes which the superfine and the vulgar alike enjoy are obtained in a very prosaic way. They are produced in a land where the flowers are perennial, but the processes of manufacture include not only distillation and fermentation, but even boiling in fat. Consul Harris, writing from Nice, where the manufacture is carried on extensively, describes the processes. In distillation the flowers are boiled in an hermetically-sealed copper vessel. The steam as it condenses in its passage through a spiral coil exudes the volatile essence drop by drop, and it is collected in a small glass vessel. The water in the copper retains a small portion of the scent and becomes the rose water or orange flower water of trade. All flowers are not susceptible of this treatment, and those that are produce but a minute quantity, the orange flower, for instance, giving but one gramme of essence for one kilo. of flowers, or but one-thousandth part. The following table will show the proportionate yield of the different flowers:—

Neroli...............	1,000 kilos.	of flowers	1 kilo.	of essence
Rose	25,000	do	1	do
Geranium	1,000	do	1	do
Mint	1,000	do	0.750	do
Orange leaf (bitter)	1,000	do	1	do
Lavender	100	do	0.500	do
Eucalyptus	100	do	0.500	do

The volatile essences thus obtained, combined and mixed together with a certain quantity of alcohol, are used in the preparation and as the basis of eau de Cologne, toilet vinegar, lavender water, &c.

The perfume from flowers which do not contain the volatile essence is extracted by two processes. In the first or cold process, cassie, jessamine, jonquils, tuberoses, violets, and some other flowers, freshly gathered, are placed upon a layer of pure lard, a quarter of an inch in thickness, spread over glass trays. The flowers are changed every twelve, eighteen, or twenty-four hours, according to circumstances, until the lard is sufficiently charged with perfume. Jessamine and tuberose are changed as often as fifty times, and the other flowers from twenty to thirty times. When the hot process is resorted to grease is placed in a copper vessel, together with the flowers, and the compound is boiled. Additional flowers are added from time to time until the fat has absorbed the requisite amount of perfume. By another process the perfumes are extracted from the fats, and, by blending these with the different essences, the numerous scents are obtained. Certain perfumes which are of great use in the manufacture of scents can only be obtained by the fermentation of fruits, flowers, and roots.—*P. M. Budget.*

A RAILWAY FOR EAST AFRICA.

Lieutenant Weiss, who, together with the late Dr. Juhlke, explored the country from Pangani to Mount Kilimanjaro in 1885, discusses in the German *Colonial Gazette* a scheme for laying a railway in East Africa from the coast to the neighbourhood of that mountain. He points out that Usambara is very fertile and healthy, so that the construction of a railway there would be a splendid factor in the development of German East Africa. The line as proposed would start from the German station of Tanga, and touch at the following stations:—Amboni, a plantation of the German Planters' Company; Umba, an English mission station on the Ubumbine, a tributary of the Mkulmusi, which flows into Tanga Bay; and Mtangate, 4½ miles from the great English mission station of Magila. The line will then pass to the south of Lewa, the great tobacco plantation of the East African Planters Company, and will strike the Valley of the River Pangani, where it is 476 feet above the sea level. Korogwa (951 feet), a deserted station of the East African Company, and Masinde (1,679 feet), the residence of Limbodja, the chief of Usambara, will be touched, and the line will then be continued to the west along the Pare and Ugueno Mountains to Aruscha (2,421 feet), at the foot of Kilimanjaro. The total length of the line from Tanga to Aruscha is given as 223 miles. Lieutenant Weiss estimates the cost of building such a railway at 500,000*l.*,* and the yearly working expenses at about 56,000*l.* He asserts that the country at the foot of Kilimanjaro is so salubrious, in consequence of its altitude, that German peasants could settle there. He recommends also that a sanatorium should be built there for those Germans stationed on the coast who may suffer from fever.—*O. Mail*, May 30th.

* Absurd: the sum may be multiplied by 4.—ED. *T. A.*

THE BURMA RUBY MINES.

The following memorandum, drawn up by Sir Lepel Griffin, the Chairman of the Ruby Mines Company, on his return from visiting the mines, has been issued:—

At the request of the Board of Directors of the Burma Ruby mines, and some of the largest shareholders, I visited the mines at Mogok in March last in order to ascertain what were the prospects of the undertaking, the difficulties to be overcome, and to settle any important questions which might be under discussion between the Company and the Local Government.

I have returned within the last few days, and having spent a sufficient time at the head-quarters of the Company—Kyatpyin and Mogok—to make myself thoroughly acquainted with the state of affairs, pending the calling of a general meeting, the board consider that it is desirable to circulate a brief memorandum to inform shareholders of the existing position, and what and how near are the prospects of success. I may say at once that I have returned with a firm

conviction that the eventual prospects of the Company are exceedingly good. There is no doubt that rubies are being found in large quantities by the native miners who have an hereditary right to work under certain conditions.

The reason that rubies of high value and in large quantities have not yet been obtained by the Company are two :—the non-arrival of the machinery required to develop the mines, and the wholesale smuggling of stones in defiance of the regulations under which the Company have the right of purchase of all stones found by the native miners.

Mogok is situated in a mountain region covered with dense forests, approached by 65 miles of exceedingly difficult country, over which a road has only been completed for a few months. Even now this road is unmetalled and only suitable for fair weather traffic.

It has been almost impossible to convey heavy machinery to the mines, and scarcely anything at the time of my visit had reached there in a complete and working condition. This state of things is being rapidly improved. Large quantities of machinery had arrived at Thabetyin, the terminus on the river, and at Khabine, midway between the river and Mogok, and were being pushed forward with all speed. It is a matter of regret that the arrival of the machinery has been so long delayed, but it has depended on physical considerations beyond the Company's control.

The second reason for the failure of the Company to obtain rubies from the natives was the universal and practically unchecked system of smuggling. The native miners were bound to produce their stones and dispose of them to the Company at a reduction of 30 per cent on their declared value. Smuggling was however so easy that the effect of this tax, which formed one of the rules framed by the Government under which the lease was taken by the Company, was that miners brought in no valuable stones for sale to the Company's agents; all such were smuggled and sent down country for disposal at Mandalay, Rangoon or Calcutta, and it is asserted that 20 lakhs of rupees' worth of rubies are annually disposed of in the town of Mandalay alone. These inefficient rules, which were absolutely inoperative to prevent smuggling, and which only caused loss to the Company instead of benefit, I have with the full concurrence of the Local Government and with the approval of all officers acquainted with the situation, abolished, largely increasing the tax which individual miners pay to the Company. The sale of rubies found by the native miners is now free, and it is expected that they will bring a large proportion of the best stones to the Company's agents for purchase.

It is estimated that the tax paid by them, will commence at the rate of R100,000 per annum, rise to R140,000 when the full complement of miners is employed, and may hereafter largely increase by the general raising of the tax. This system will, it is hoped, give the Company an assured and increasing income, and also secure to them a large proportion of the most valuable stones found.

Great progress has been made in the erection of houses for the staff and officers, and workshops, and the machinery is being erected as it arrives in suitable places, especially at Kyatpyin, which is the engineering head-quarters. The river which runs through the Mogok valley has been diverted, in order that the bed may be mined to a greater depth than the native workmen were able to go without pumping machinery.

The slow progress in development is partly due to the malarious character of the climate; almost the whole of the staff have suffered from fever, and some have resigned in consequence of continual attacks; even in March when the climate seemed excellent, I found several of the employés suffering. This difficulty will decrease as the staff become acclimatised, and as better food is procurable, for which arrangements have now been made. The town of Mogok has about 3,000 inhabitants, entirely supported by the ruby trade; it is a flourishing settlement and the great wealth of many of the inhabitants testify to the richness of the industry. Many of the wives and daughters of the miners wear valuable jewellery, and the houses are substantial and well-built. The country around is however most sparsely inhabited and the labour, which is expensive, is mostly drawn from the Chinese frontier, and has only hitherto been available for a few months in the year. The staff at Mogok are thoroughly sensible of the necessity of exerting themselves to the utmost to obtain favourable results, and there is every reason to hope that this will ere long be attained.

The head of the Local Government, Sir C. Crosthwaite (accompanied by the Financial Commissioner), was with me at Mogok during my entire visit. From them, as from the local officials, the utmost assistance has been received, and the Government are warmly interested in the success of the Company's operations.

In conclusion, while it would be unfair to look for immediate returns from an undertaking to which so many unfavourable conditions are attached, I have no doubt whatever, that before very long, when our machinery is in operation and as the staff become acclimatised, satisfactory results will be attained, and the anticipations formed respecting this property be fully realised. I am convinced that the rubies are to be found in the Company's concession in large quantities; and energy on the part of the Company's officials in Burma will ensure their being found, when approved machinery has been set up and sufficient and reasonable time has been allowed for the development of the property. An early meeting of the shareholders will be called, and any further information which may be desired will be fully furnished.—*Pioneer.*

MISNOMERS.—The Providence "Journal" calls attention to some curiosities of misnomer. Blacklead is not lead at all, but a compound of carbon and a small quantity of iron. Brazilian grass never grew in Brazil, and is not grass—it is nothing but strips of palm-leaf. Burgundy pitch is not pitch, and does not come from Burgundy—the greater part of it is resin and palm-oil. Catgut is made from the entrails of sheep. Cuttle bone is not bone, but a kind of chalk once enclosed in the fossil remains of extinct specimens of cuttle-fish. German silver was not invented in Germany, and does not contain a particle of silver. Cleopatra's Needle was not erected by the Egyptian queen, nor in her honour. Pompey's pillar had no historical connection with Pompey in any way. Sealing-wax does not contain a particle of wax, but is composed of Venice turpentine, shellac, and cinnabar. The tube rose is no rose, but a species of polyanth. The strawberry is no berry, but only a succulent receptacle. Turkish baths did not originate in Turkey, and are not baths, but heated chambers. Whalebone is not bone, and is said not to possess a single property of bone.—*Medical Record.*

ANOMALIES OF POISONOUS PLANTS.—The *Cicuta virosa*, or Cowbane, is poisonous to oxen but wholesome to sheep, goats, and horses, as Lucretius long ago recorded. White-ants feed with impunity on opium. The landcrab feeds upon the mancikeel tree, one of the most deadly of trees. The *boxia*, or grosbeak, of the Bahamas, eats the fruits of the *Amyris toxifera*, or poisonous ash. The berries of the spurgelaurel, *Daphne laureola*, are poisonous to animals, but birds eat them freely. The young buds of *Kalmia latifolia* speedily kill cattle if they browse on them, but afford abundant food to pheasants in early spring, and although the birds do not suffer, persons who partake of such pheasants show alarming symptoms of poisoning. A similar result is observed from bees feeding upon other plants of the same natural family as the Kalmia (*Rhodoraceæ*). In the celebrated retreat of the ten thousand, the soldiers of Xenophon suffered severely from eating honey near Trebizond, collected from the *Azalea Pontica*. The darnel, *lolium temulentum* (the *infelix lolium* of Virgil, the tares of Scripture), injures all animals, yet chickens eat the seeds with greediness. Horses feed with avidity and thrive on the *agrostis arundinacea* (Linn.), or reed bentgrass, which is destructive to goats. Many similar facts are noted by botanists, and they show the futility of defending cruel experiments on animals by appealing to the effects of substances on other organisms. What is food to one is often poison to another.—*Ibid.*

TEA AND CINCHONA IN CEYLON.

THE TEA AND CINCHONA ENTERPRISE OF MESSRS. KEIR, DUNDAS & CO. ON LOOLE CONDERA AND MR. JAMES TAYLOR'S MERITORIOUS PART THEREIN.

The discussion regarding a testimonial to Mr. James Taylor justifies the publication of the following letter. It was put into type and our note written in Feb, 1878, that is *twelve years* ago last Feb. (!) ; but it was held back, we think, because Mr. Taylor feared his employers might object to the publication of the details. Now, we consider that the document is an important contribution to the History of the Tea and Cinchona Enterprise in Ceylon.

Loole Condera, February 16th, 1878.

A. M. Ferguson, Esq., and J. Ferguson, Esq.

My dear Sirs,—I have to thank you kindly for your very favourable notice of our Loole Condera tea in a late *Observer*. It is now being made of a better average quality than before. But it will not be all it should be till we get it in larger quantity so as to require a European or good conductor to constantly supervise the manufacture. I can see only very little of it, and beyond that it is left to a kangany and the coolies. But such a notice of it in the *Observer* is very valnable. I must explain to you, however, that bad tins have been got by people frequently, not from any fault on the estate but by a mistake in Kandy. I used to send a lot of it to Kandy, to Messrs. Keir, Dundas and Co.'s office, in large caddies, not soldered up; understanding that they were selling it by the lb loose or untinned. But they took to putting it in tins and soldering these up in Kandy. I supposed that this would not do, and stopped it as soon as I heard of it, or heard of tea being so spoiled. It soon gets damp in the caddies, and I fancy got more damp still in being transferred from them to tins where they had no firing places to dry it first. Not only this, but they apparently tinned up "red leaf" too; and that also damp. I send several caddies of "red leaf" at the end of each year's crop, with special explanations of its inferiority and instructions to keep it apart and dispose of it in any way or at any low price they choose. Some of these tins it would seem were still in their hands recently, and may be yet. They themselves sent out three of them that had been retnrned by Dr. Thwaites, of Peradeniya, *quite recently*, and asked me to explain the matter! Two of these tins were red leaf *purely*, and perfectly mouldy; the other tin being proper tea but also perfectly mouldy. Seeing I never tinned any red leaf, I had no difficulty in saying that it was tea tinned in Kandy and spoilt in being so. But it is long since I stopped sending them any loose tea now, excepting the little "red leaf" collected during the year at the end of each crop, which will still go forward open. All of it is tinned on the estate now. I have also got the tins made so that they must be destroyed in the opening, as I found that people kept their tea in the tins, or let their servants do it, and consequently the tea got spoiled and often mouldy and musty before the tin was finished; especially in damp weather. This made some people believe that we put bad tea into the bottom of the tin and good tea on the top! K., D. & Co., too, stopped taking back our first style of tins with hinged lids, as they were generally retnrned filthy and stinking of oil and onions and salt fish, &c.

But now, I am going to be down on you! Although you have publicly given us credit for various things connected with tea and cinchona, some of which were no fairly due to us, yet you have never given us credit for the main things that are our due. I claim that both the tea and cinchona enterprises were first successfully started on Loole Condera. I do not admit the Messrs. Worms' old tea experiments into the matter, as they were failures; and long ago given up when we began. The plants were allowed to remain, but there were many tea plants in gardens, and so on, over the coffee districts besides them. The starter of the present tea enterprise was, to the best of my knowledge, Mr. G. D. B. Harrison, who, in 1865, gave me orders to get all the tea seed I could from Peradeniya and grow it so as to have a supply of seed from it by-and-bye. I began in 1866, to plant out tea plants along the roadsides here. At that time I knew nothing of the Assam indigenous and hybrid varieties. Our first tea clearing of twenty acres was felled in the end of 1867, a year before the Ceylon Company felled any land of their estates for tea. Our clearing was mentioned in the *Kandy Herald*, at the time it was felled. The Ceylon Company felled small pieces on several of their places the year after, perhaps as much, or may be more, acreage than our clearing altogether. However, our first year's importation of seed from Assam completely failed to grow. We got our second importation of seed next year at the same time as the Ceylon Company got their first and both grew. So that they and we both began the actual planting out of *hybrid* tea at the same time, or same season. Then as for making tea I was making it from old bushes in the garden and from roadside planing years before Mr. Jenkins, the Ceylon Company's tea manager, came to Ceylon. Some of what I made then was fairly good tea though I could not believe it was right because it did not taste like the China tea of the shops. I gladly confess that Mr. Jenkins, after he came, showed me how to do it better and gave me confidence in the article. But a sample made by me before he came, sent along with a sample of his making, was valued in Calcutta at only 3d a lb. less. Before Mr. Jenkins gave me confidence that the tea was correct, I spoiled large lots of it experimenting, trying to make it taste like the tea I bought in Kandy from shops.

You will see from this that a statement in one of your Directories of tea acreage planted is wrong for the earlier years. There was more planted than you state; but I cannot find that statement in the Directory now, else I would help to correct it. But on this place there were twenty acres planted, besides roadsides equal to a good few acres, before the end of 1869.

Then, as regards Cinchona: we were not the first to plant a patch of it, though we planted five or six acres of it pretty early. But the small lot mentioned in Howard's big book as the "first instalment from the Ceylon plantations" was peeled on Loole Condura in July 1867, both Succirubra and Officinalis. But so little did K., D. & Co. trouble themselves about it that it only got into the market in April 1868. It was mentioned in several papers that I saw about the time and I knew it was our sample they referred to from the remarks made, being the same as Howard's report on it that I had got, and from dates and the quantities corresponding, and the words of Howard's report being quoted. One paper or magazine put it down as from the Ceylon Government experiment. Our first extensive peeling was in April 1870, of considerably over a ton of dry bark, partly succirubra and partly officinalis. Long after this was sold in the London market, the *Observer* mentioned that it had discovered the fact from a Home paper and asked how such a thing could have happened unknown to it. We sent home further lots in 1871 and 1873. As a resnlt of the sale of the first lots, we got all the officinalis plants out of the Hakgala nurseries, even the old stock plants, about three hundred thousand altogether, and got them for nothing, as there was no demand for cinchona by anyone else. We then went in for planting cinchona extensively; but we had considerably extended our cultivation of it before that on the strength of the sales and Howard's report on our original sample. Not very long after cinchonas planted at Hakgala were being sold at high prices, but the demand was mostly for succirubra plants, of which we had taken none. So that our having cleared out the stock of officinalis plants did not, I suppose, much matter What we have done here has been a guide and a warning to others all along, and is so still, and a great deal of cinchona and also tea, I believe, has been planted on the strength of it. What we have learned here has been freely communicated to all who have asked information. If you will allow me to say it without thinking that I have any selfish object in view, I consider that, if the Ceylon Government had any sort of soul in it to encourage

European enterprise instead of simply existing to take advantage of it, Massrs. Harrison and Leake ought to get a free grant of a block of land for cinchona and tea, or be offered it.*—Yours very truly,

JAMES TAYLOR.

AUSTRALIAN PRODUCE FOR CEYLON.—We can testify that the cheese, bacon and butter consigned to Messrs. Auwardt & Co., as advertised, from the farfamed Illawara district of New South Wales is specially deserving of attention here. Each article seems good in its degree—good valuo for the price charged—and planters especially will favourably bear in mind that the proceeds of the sale of this produce is to be re-invested in Ceylon tea for the benefit of the Illawara farmers and other residents.

BRAZIL COFFEE.—The coffee crop now in course of shipment from Santos to the markets of Europe and the United States is estimated to reach 2,000,000 bags (132 lb. each) by June 30th, 1890, the end of the crop year. This is a falling short of over 1,000,000 bags on the production of last year, due to the fact that a small bearing generally succeeds a heavy one, the previous harvest of 1888-89 having been the largest on record. Although the present crop is a small one, its monetary value is in excess of the last, in consequenco of the higher prices obtained.—*H. and C. Mail.*

THE SOURCES OF BEAUTIFUL COLOURS.—The *American Druggist* has formulated a list of the choicest colours used in the arts, as follows:—The cochineal insects furnish a great many of the very fine colours. Among them are the gorgeous carminc, the crimson, scarlet carmine and purple lakes. The cuttle-fish gives the sepia. It is the inky fluid which the fish discharges in order to render the water opaque when attacked. Indian yellow comes from tho camel. Ivory chips produce the ivory black and boneblack. The exquisite Prussian blue is made by fusing horses' hoofs and other refuse animal matter with impure potassium carbonate. This colour was discovered accidentally. Various lakos are derived from roots, barks, and gums. Blue black comes from the charcoal of the vine stalk. Lamp black is soot from certain resinous substances. Turkey red is from the madder plant, which grows in Hindostan. The yellow sap of a tree of Siam produces gambcge; the natives catch the sap in cocoanut shells. Raw sienna is the natural earth from the neighbourhood of Sienna, Italy. Raw umber is also an earth found near Umbria and burnt. Indian ink is made from burnt campbor. The Chinese are tho only manufacturers of this ink, and they will not reveal tho secret of its manufacture. Mastic is made from the gum of the mastic tree, which grows in the Grecian Archipelago. Bister is the soot of wood ashes. Very little real ultramarine is found in the markot. It is obtained from the precious lapis-lazuli, and commands a fabulous price. Chinese white is zinc, scarlet is iodide of mercury, and native vermilion is from the quicksilver ore called cinnabar.

* And certainly Mr. James Taylor ought to get one of the best blocks in the country. Messrs. Harrison and Leake deserve credit for their enterprise, and it is much to bo regrottod that they suffered so greatly the usual fate of pioneers. But as regards both tea and cinchona the intelligent, energetic and persevering Superintendent of Loole Condera was the first man "to teach the English how to do it." Much of what Mr. Taylor now communicates reached the senior editor long ago and has been tied up with a mass of other matter on tea and cinchona to be worked wheu time could be got. But each day brings more than its work. One small fact will show how conscientiously careful Mr. Taylor is in his work. Strict cleanliness is of much importance in the preparation of tea; and when coolies are seen dressed in specially clean clothing, the remark made is, "Some of Taylor's tea coolies."—ED. *T. A.*

FINE PRICES FOR COCOA.—Ceylon cocoa is now one of the most valuable products sent out of the island, and is in great request. Some cocoa from one of Mr. J. H. Barber's estate has just been sold, we hear, for R58 per cwt. This is a fine price considering the high rate of exchange at present, aud should encourage all those who have suitable land for this very remunerative product.

MINERAL RUBBER.—The *Bulletin du Musée Commercial* gives currency to a report from an American source that an American has discovered a means of producing, by distillation from coal, a bituminous substance possessing all the qualities of rubber, and which may be equally well used in the manufacture of submarine cables. The cost of this article is said to be much less than that of vegetable caoutchouc.

COFFEE.—There have lately been frequent calls for Mr. W. B. Forsyth's report on coffee, and as the number of the *Monthly* which contained them is exhausted, it is reprinted in this issue with Mr. Kinney's—both of which are valuable to those intending to engage in coffee planting. Among all the minor industries adapted to our climate, there is none whieh will pay better than coffee cultivation. Kona coffee is worth to the grower twenty cents a pound, and probably will command that price for many years, as it has no equal.—*Planters' Monthly*, (Hawaiian).

GEMS FROM GAS REFUSE.—To make precious stones from gas-refuse is indeed—says the *L. & C. Express*—to squeeze out the romance which should cling to "pearls from the ocean and gems from the mine." Mr. Greville Williams, of the Gas Light and Coke Company, has made a perfect emerald from the refuse of a gas retort. That this was possible has been known to science for two generations. But although there is nothing new in this ingenious play with science—despite, too, that the cost of making the gem was ten times its highest value—the news has caused some alarm among possessors of fine emeralds.

PLANTING IN NORTH BORNEO.—At the ordinary general shareholders' meeting of the Labuk Planting Company at Hongkong on the 5th instant, the report presented was passed after the Chairman had said that he could add very little to it, except that the latest accounts from the manager were very encouraging, and although there must be numerous difficulties met with the first year he hoped they would vanish as time went on. The trouble in starting a plantation was getting labour—it was the case with all new estates. He admitted that the item of $15,717 in the accounts under the head of "labour" meant squeezes to coolie brokers, but pointed out the impossibility of getting coolies without paying for them. He was hopeful of getting the money back in the form of labour. —*Straits Times*, May 18th.

DENDROBIUM MACCARTHIÆ.—In copying the following paragraph from an American periodical, *Garden and Forest*, we may state that this plant was named in honour of Lady MacCarthy by the late Dr. Thwaites, who was the first to describe it:—

This magnificent plant is now flowering freely at Kew. It is one of the least common in gardens from the fact of its being bad to cultivate. It is found only in Ceylon, where it is much less plentiful now than it was a few years ago, owing, probably, to the visitations of the Orchid-collector. The Kew plants have this year made pseudo-bulbs over a yard long, and they bear near the top pendulous, three-flowered racemes, each flower being four inches across when fully expanded; the colour is pale rosy mauve, with a large blotch of maroon-purple on the lower part of the lip, and streaks of the same color on the front portion. The Kew plants are grown in a very hot, moist stove, where they are kept saturated at all times save when the leaves are falling. It grows all through the winter, the flowers pushing immediately after the leaves have fallen.

HOME CRITICS ON CEYLON TEAS.

It may be relied upon, we think, that, as a general rule, the verdict of the public is the most satisfactory test of the quality of any article of food consumption. If that reliance may be accepted, we may say that our teas have stood this test for they have received the warranty of public taste. It is, however, constantly the case that papers published at home offer to their readers comments upon the method of their manufacture which would seem to imply that there yet remains much room for improvement in that method. We are not at all disposed to offer objection to this. In the first place, whether what is advanced is or is not to be justified, there can be no doubt that the articles written bring our production well before the public and so constitute for our teas a valuable advertisement. In the second, if there be truth in the old proverb that "in the multitude of councillors there is wisdom," we are afforded by them an opportunity of discriminating for ourselves amid such diverse advice.

Nevertheless we must bear well in mind the character of the sources from which many of the comments referred to emanate. What may be termed trade journals are, we think, not unfrequently biassed by the interests—or the supposed interests—of their chief readers, the retailers of tea. Among these there must be many who are influenced by a variety of causes in favour of promoting the sale of some particular kind of tea. One such dealer, we will assume, has a large constituency among whom he has hitherto distributed chiefly the teas of China growth. Another may be so influenced mainly to support Indian teas. Such men have probably resorted to long established agencies for their purchases, and have secured by their long custom exceptionally favourable terms. They will have no pressing desire, therefore, to force the introduction of a new growth which, if successful, must disturb the even course of their trading arrangements. For men so situated the Trade Journals must purvey sympathetic matter, and for the reasons we may perhaps believe that much that appears in the columns of such papers may be the result of a concealed bias. The arguments that we have thus applied in the case of the retail-dealers are not wholly inapplicable to a higher grade of the distributing agencies. Among the brokers of London there are firms who, equally with the retail grocer, have long made a speciality of certain teas. When firms coming within such a category issue their circulars, they are just as likely to have their advice tinctured by preconception as are the grocers in their dealings with their old-established customers. Of course we would except from brokers liable to such an influence, many well-known firms whose advice may always be accepted with confidence and whose comments should command our fullest attention. But even when such exceptions are made, there remains a residuum of the often-repeated complaints which should, we think, always be accepted with reserve.

But whether this caution may or may not be justified, one fact is certain, and that is that the constant and very often contradictory advice given is very perplexing to our planters. A very well-known firm of high standing has once more made public a statement that Ceylon teas are as a rule over-fired, and that statement has formal support by one of the trade journals to which we have referred. Our tea planting industry is now by no means a thing of today, and its production has stood the test of a good many years. The result of that test has been to secure the suffrage of an enormous number of tea drinkers throughout the world. If we are to accept the counsel now tendered to us and alter our methods of preparation, is it certain we shall still retain that suffrage which has been accorded upon the experience of our present methods? We do not say that we feel confident that no better method is open to us; but for the reasons we have above stated we would advise caution in placing implicit confidence in the soundness of the counsel which is so constantly given to us by the distributing agencies at home.

Indian Soapstone.—Steatite or soapstone is rather extensively used by gas manufacturers at Home, but at present their requirements in this respect are met from Germany principally. Some time ago the value of Indian soapstone attracted attention, and experiments were made and promised successfully. A more extensive trial is now to be given to the Indian product, and the Madras Government are sending some tons of the material home, where the India Office will cause it to be experimented with and reported on.—*Indian Engineer.* [Steatite, we believe, is amongst our Ceylon rocks.—Ed. *T. A.*]

Bricks Superseded.—A Madras contemporary makes the announcement that bricks are to be superseded. A composition called petronite has been discovered which, besides being cheaper than bricks, is of snowy whiteness, and of the hardness of granite. It is made of sand and silica, burnt, ground up, moulded with moisture under great pressure, and then re-burnt. As it shows neither expansion nor contraction after burning, and as it is capable, when in its moist condition, of being sculptured to any desired extent, it will be of high value for decorative as well as for ordinary building purposes.—*Indian Engineer.*

Tea in Japan.—The *Japan Weekly Mail* of 31st May says:—

The tea trade goes on apace; 20,009 piculs of leaf were taken during the week, and some firms have been firing almost incessantly. As remarked as probable last week, the estimated weight of the first crop was somewhat erroneous, and this is now admitted, as the shortage, if any, will be comparatively slight. Second crop leaf will be on the market by the 5th of June, but as to quality nothing can now be said, though the weather reported from the principal districts is not unfavourable to good cup.

The same paper in its issue of 7th June says:—

Tea has fallen off somewhat in demand, though firing is still general. Parcels of second crop have arrived, and are reported good both in leaf and cup, and in another week a large quantity is expected to be on the market.

Prevention of Scale in Steam Boilers.—The *Chemical Trade Journal* recommends that water used for boiler purposes should be so treated before entering the boiler, that all formation of scale shall be prevented, and deprecates the use of substances which merely prevent the scale from adhering to the boiler. As an example of how various precipitating agents may be used in conjunction with one another a water which contained 5·2 grs. of calcium carbonate, 24·3 grs. of calcium sulphate, 0·15 grs. of magnesium sulphate, 4·27 grs. of magnesium chloride, 17·27 grs. of magnesium nitrate per gallon, was treated with a mixture of 17 grs. of caustic soda—77 per cent.—17 grs. of sodium carbonate, 5 grs. of tribasic phosphate of sodium, with the result that of 12·9 grs. of lime only 0·78 grs., and of 6·6 grs. of magnesia only 3·78 grs. remained to enter the boiler and this at a cost of 3½d per 1,000 gallons. The precipitate amounted to 25 tons semi-dry sludge—or nine tons dry—from 5 million gallons of this water per week.—*India Rubber Journal.*

ASSAM AND CEYLON AND THEIR TEA CROPS.

Assam-proper and Ceylon will this year be very nearly matched in the tea crops likely to be harvested within their bounds; and it should be extremely interesting to watch henceforward the development of each country under tea production and export. We are apt to regard "Assam" as if it really represented the great Indian tea enterprise altogether; but of 115 million lb. expected to be harvested in 1890-91 for all India, less than half—or 48,295,344 lb.—is put down for "Assam" proper. Now against this Ceylon may ship 47 millions in the present year—or possibly more? Already up to 19th June, the return is of 22 millions,—say 24 millions to 3rd July,—and the larger shipments have uniformly been in the latter half of the year.

The Indian Tea Association as we have indicated treat "Assam" separately from "Cachar and Sylhet," the current tea crop of the latter being given at 33,385,650 lb.; but unfortunately they do not give us the acreages of cultivated land on which their estimates are based; and when we turn to the official records we invariably find that "Assam" includes "Sylhet and Cachar." One official return, for instance, gives the area under tea in Assam in 1889 as 227,249 acres:—196,689 acres mature and 30,560 acres young tea. Another Indian Bluebook return makes the total for 1888-89 as 216,676 acres, but this extent, we find on going over the detailed statements is made up as follows:—

		Acres.			*Acres.*
Cachar	equal to	55,401	Sibsagur	equal to	47,377
Sylhet	,,	44,145	Lakhimpur	,,	32,144
Goalpara	,,	367	Naga Hills	,,	——
Kamrup	,,	6,227	Khasa and		
Dairang	,,	20,012	Jaintia Hills	,,	30
Nowgong	,,	10,973	Garo Hills	,,	——
			Total acres		216,676

Deducting 99,546 acres for Cachar and Sylhet, we have only 117,130 acres for "Assam-proper" to represent the estimated current crop of 48,295,344 lb. and this shows an average outturn of over 400 lb. per acre. In the case of Cachar and Sylhet, the crop estimated is equal to 340 lb. an acre, and that without making allowance in either case for immature tea. Ceylon on the other hand will gather her 47 to 48 million lb. from a considerably larger area nominally; for even leaving out all tea planted within the past three years, we cannot reduce the area below 150,000 to 160,000 acres. Of course the Assam tea fields are on the whole much older than ours, and if we suppose that 105,000 acres represent the mature tea yielding 48 million lb., we may get a fair idea of the difference in yield. The explanation of course, is that Assam was all planted on virgin land (forest or otherwise), whereas the greater proportion of Ceylon tea is found on old coffee plantations varying from those that scarcely yielded any coffee crops to others so long heavily cropped with the fragrant berry that 200 lb. of made tea per acre is a liberal estimate of their yield in this new era. Although therefore, Ceylon may steadily compete with "Assam" (in the limited sense) in her total crops, it must be borne in mind that our harvesting will be from a considerably wider area in tea. The total extent in tea in Assam districts, Cachar and Sylhet,—whether 216,676 or more likely 227,249 (including 30,560 acres young tea)—is singularly close to the present return for Ceylon of 219,487 acres; but the difference is that the former is to give nearly 81¾ million lb. tea this season against not more than 48 millions for Ceylon.

CROCODILE AND LIZARD LEATHER.

It has been said—and, doubtless, with full truth—that there is nothing in created nature which does not serve, or cannot be made to serve, some useful purpose to man. We confess that with regard to the crocodiles, or, as they are often popularly but incorrectly termed, alligators, which swarm in our inland waters, we have often found it difficult to recognize the part they have been destined to play in nature's economy. As scavengers they certainly exercise a useful function; but their wonderful fecundity carries them beyond the sufficient fulfilment of this object, and the enormous numbers of them, which may almost be said in some parts, such as the neighbourhood of Mullaittivu, to thicken the waters of our lakes, pools and tanks, constitute an undoubted nuisance as well as a considerable danger to many of the native community. Some time ago we made reference to the demand which had sprung up in all European countries for the skins of these saurians; and having then drawn attention to the possibility of Ceylon usefully meeting that demand, we should have hesitated to have again advanced the subject, were it not for a further "craze" arising in those countries which might, we should say, be met with advantage from this colony.

We allude to the very extensive adaptation of lizard and even snake skins, in many articles of personal adornment. The category of these is almost an endless one; but we may specially instance such items as ladies' waist-belts and watch-bracelets, purses, whip handles, cigar and cigarette cases. In fact, a walk now through the principal streets of London or Paris reveals in their shop windows a vast variety of instances of the application of the skins of these reptiles to such and similar articles. We may be sure that these would not be exhibited in the profusion that may be witnessed were it not that they meet with a ready sale indicating a strong appreciation on the part of the public. Now Ceylon abounds only too profusely, not only with the crocodiles first referred to but with a great variety of many-colored lizards, and with the inducement now offering of a profitable market for their skins, why should not some of our native people undertake the collection and shipment of these?

We shall probably be told that the art of proper preparation is at present unknown in the island. But every civilized Government makes it one of its chief duties to stimulate new industries; and in tropical countries, in which the local authorities stand almost *in loco parentis* towards the natives, this duty assumes a special weight. We have but to read the reports of the consular agents of European countries to realize how important a part they are called upon to perform in suggesting new openings for trade or fresh industries likely to benefit the nationalities they represent. Ceylon, of course, has no such official representatives abroad. The duties therefore that are cast upon those to whom we have referred must naturally in our own and similar cases devolve upon the resident authorities. We can conceive of scarcely any case calling more strongly for the preliminary aid the authorities alone can afford the people than the one we are now dealing with. We have among us what, while unavailed of, is both a positive nuisance and a danger. It is possible to diminish this, and at the same time by doing so to place within the reach of a population not too well supplied with the means of earning a livelihood what promises to be an easily learned and profitable industry. What greater inducement could there be

to incite to action a Government which, as we have said, stands in almost a parental relation to the people over which it rules?

In this particular case the assistance to be asked for is light, and the cost of it must be trifling. We want instruction as to the right method of utilizing the supplies so ultra-liberally provided by nature. This it should be neither difficult nor costly to obtain. But perhaps it may be said that before seeking such instruction we want enlightenment as to the prices such skins as we have referred to fetch in the markets of Europe. This, however, we think, might probably be dispensed with, for we may be perfectly sure that those markets would not be supplied as they are unless a paying price was obtainable for the commodities. We may be equally certain that no country in the world produces these saurians and reptiles in more lavish abundance than does Ceylon, as also that their capture can scarcely anywhere be effected with a less expenditure of labour or at less cost than it could be among our own people here. There is *prima facie* evidence therefore that the systematic collection, preparation, and shipment of these skins should prove remunerative. What is wanted is only the knowledge of how to prepare them to suit the requirements of distributors at home. A reference through the Crown Agents to those engaged in the trade in London would secure all the preliminary information necessary and at the same time the services of an instructor competent to impart the required knowledge to selected individuals among the natives, through whom again such training might be distributed throughout the island. We may be told that if the prospect of success be so assured as we hold it to be, it should rest with our mercantile community to inaugurate and be at the expense of the earlier trials. But it will be recognized, that a novel departure of the kind referred to requires some initiatory fostering, and we think this might well be officially given, at any rate to the extent of seeking information through the Crown Agents upon which further action might be based.

THE CEYLON ESTATES INVESTMENT ASSOCIATION (LIMITED).

Report by the Directors to the Sixth Ordinary General Meeting, to be held on Wednesday, the 11th day of June 1890, at 12 o'clock noon, within the Accountant's Hall, 106 West Nile Street, Glasgow.

The Directors beg to submit herewith the Accounts for the year to 31st March, 1890, and they are glad to be able to report such very favourable results.

The most of the Coffee Crop was, this year, sold in London, the average price being 101/8 per cwt., which the Directors consider very satisfactory. The Crop was, Glencairn 1,404 bushels, MacDuff 1,123 bushels, or more than double the estimates.

This year only 22,235 lb. Cinchona was harvested, on account of our only having taken the bark from dying trees. The good trees were not touched as recommended by the Company's Agents in Ceylon.

The Tea Crop has again been very satisfactory, and the prices realised have been considerably better than those obtained the previous year.

In consequence of the great increase in the Coffee Crop, and the high prices realised therefor, and also the increased prices obtained for the Tea, the balance at the credit of Profit and Loss Account, including £55 4s 5d brought forward from last year is £3,515 8 8

The Directors think it advisable to reduce the sum appearing at the Debit of the Tea Machinery and Factory Account, and they propose to apply the above Profit:—

	£	s.	d.
1. In writing off that Account ..	£1,000	0	0
2. In payment of a Dividend of 7½ per cent free of Tax, ...	£2,306	5	0
	£3,306	5	0
Leaving a balance of	£209	3	8

to be carried forward next year.

The addition to the Glencairn Factory, and the putting in of the Steam Engine and Boiler have been completed at a cost of £571 13s 11d, and the Directors anticipate considerable benefit will accrue to the Company therefrom, as working by water power was during the dry season very unsatisfactory, the supply being altogether inadequate.

The Directors authorised the conversion of the buildings on Macduff into a Tea Factory. The alterations have been completed and the necessary machinery put in at a cost of £447 5s 9d. The Tea, manufactured and sent home, has brought very good prices, and the Directors expect that this will also prove of great advantage to the Company, as a considerable sacrifice had to be made when the Tea was sold green.

From the Balance Sheet it will be seen that the outstanding Debentures amount to £2,850. These all fell due at Whitsunday last, and have been repaid, so that the Company is now free of Debenture Debt. It will also be seen that the Loans over property in Ceylon have been reduced during the year by £1,798 5s 9d.

The prospects for the coming year are not so favourable. Owing to the exceptionally large coffee crop this year, the Directors are advised that they need not look for much of this product during the current year. The estimate of the tea crop is, however, very satisfactory, and the Directors are hopeful the coffee crop may yet improve, and that a better yield than that now anticipated may yet be obtained.

The Directors have to record, with regret, the resignation of Mr. Nathaniel Spens, on account of his having left Glasgow for London. Mr. Spens was appointed Chairman on the death of Mr. Brooks Wright, and all along took a deep interest in the affairs of the Company. The Directors elected Mr. Hugh Brown Crum, Stock-broker, to succeed Mr. Spens on the Board.

The Directors who retire at this time, in conformity to the Articles of Association, are Mr. Robert King and the Rev. Dr. Grand. They are eligible and offer themselves for re-elcetion.

The Auditor, Mr. Moore, C. A., also retires, and he is eligible to be re-appointed.

J. B. MACBRAYNE, *Chairman.*
BROWN, FLEMNIG & MURRAY, *Secretaries.*
163 West George St.,
Glasgow, 2nd June, 1890.

BALANCE SHEET AS AT 31ST MARCH, 1890.

Liabilities.

		£	s.	d.
Capital Account— 15,000 shares of £4 each, £60,000 of which paid up £2 per share		30,000	0	0
Debenture Account		2,850	0	0
Interest on Debentures, &c., accrued but not due		55	19	11
Sundry Creditors		1,272	17	5
Profit and Loss Account		3,515	8	8
		£37,694	6	0

Assets.

		£	s.	d.
Glencairn and Macduff estates owned by the Association taken at cost price ...		25,078	2	6
Loans over Landed Property in Ceylon ...		2,114	10	0
Tea Machinery and Factory		1,460	14	0
Interest accrued but not due		45	11	3
Sundry debtors including outstanding Account Sales of Produce		1,672	3	6
Produce on hand		2,064	8	6
Cash on Deposit and with Bankers at Home and Abroad	£5,194 18 10			
Due by Secretaries ...	63 17 5			
		5,258	16	3
		£37,694	6	0

Profit and Loss Account for Year to 31st March, 1890.

Expenditure.

		£ s. d.
To Ioterest on Debentures paid and accrued ...		142 0 1
,, Salary of Foreigo Agents ...	£199 12 8	
,, Do Secretaries ...	150 0 0	
		349 12 8
,, Law and Audit Charges		36 10 7
,, Books, Stationary, &c.		8 2 10
,, Charges		15 12 6
,, Telegrams		23 7 6
,, Income Tax...		32 8 2
,, Postage and Petties		9 2 7
,, Directors' Remuneration		120 0 0
,, Directors' Travelling Expenses		12 12 0
,, Advertising		0 11 6
,, Depreciation		49 1 6
,, Balance, being Profit on year		3,515 8 8
		£4,314 10 7

Revenue.

		£ s. d.
By Balance from last year		81 9 5
Less : Income Tax on Dividends ...		26 5 0
		£55 4 5
,, Profit on Year's Working of estates—		
Produce sold and on hand	£8,000 18 5	
Less : Expenditure	4,072 12 11	
	£3,928 5 6	
Less : Loss on Realisation of 1888-9 Produce	20 10 10	
		3,907 14 8
By Exchange		28 5 7
,, Interest on Investments		281 4 10
,, Commission		39 13 7
,, Registration and other Fees		2 7 6
		£4,314 10 7

Brown, Fleming & Murray, Secretaries.

THE LIBERIAN GOVERNMENT CONCESSIONS AND EXPLORATION COMPANY, LIMITED :

India-Rubber.

The prospectus informs us that "this company has been formed for the purpose of purchasing the valuahle India-rubber concession, granted by the Government of the Republic of Liberia, West Coast of Africa, for the sole right of collecting the India-rubber grown on all the government lands and forests, and the sole right of exporting all India-rubber grown within the territories of the Repuhlic of Liberia, such concession further granting the concessionaires 2,000 acres of land, to be selected by them, for the purpose of erecting warehouses, stores, residences, and establishing depôts, wharves, and trading stations, or for such other purposes in connection with the oouccssion as the concessionaires may from time to time deem necessary or desirahle, and to be held free of any chargo whatever; and if hereafter thought desirable, work such concession, or to sell or lease the whole or portions there of to companies or individuals; and also to take over, work, sell, or lease to companies or individuals. at the discretion of the directors, any other concession or concessions which may now or hereafter be obtained by the company from the Government of the Liherian Republic. The rubber concession covers the whole area of the government lands ou which the gum elastic rubber tree is found, producing rubber of the best West African quality, and the Govcrnment estimate that a minimum of 2,000 tons can bo collected annually, (and also the sole right of exporting all other rubber grown withiu the territories of the Ropublic of Liheria) which, delivered in Loudon or Livorpool, including the ro yalty to be paid to the Government of Liberia, will it is estimated show a profit (if only realising 1s per lb.) of £112,000 per annum. Labour is cheap and plentiful, and the natives of this part of Africa are industrious. The use of rubber is being very largely extended, and is being brought into general use for manufacturing purposes, and is now being extensively nsed in Berlin, Hanover, and Hamburg, in connection with other materials, for paving the streets, and no donbt will soon be applicable for many other similar purposes."

The area of the Republic is estimated to be about 150,000 square miles, or about 96,000,000 acres, most of which is of the richest character, yielding almost every known kind of tropical produce, whilst the value of its mineral wealth can scarcely be estimated.

But besides trading in India-rubber, the company propose also to procure further concessions for getting and workiug minerals; for cultivating fibre-producing plants, &c.; for collecting palm oils, indigo, timber, and dyewoods; for trading in ivory, &c.; and also for a charterod State Bank, and various public rights. The Liberian Government has undertaken not to grant these ooncessions without first offering them, through Mr. Ellis Parr, to this company.

The price to be paid to the vendor (Mr. Ellis Parr) for the India-rubber concession, and in respect of his interest in the other concessions whioh have been applied for, has been fixed by the vendor at £70,000, payable as to £7,000 in cash, and as to £23,000 in fully paid ordinary shares, £3,000 in deferred shares, and the balance in cash or fully paid ordinary shares, or partly in cash and partly in shares, at the opinion of the directors; the deferred sbare ranking only for dividend after the company has earned sufficient to pay a dividend on the ordinary paid up capital of twenty-five per oent, when the deferred shareholders, after receiving a dividend of twenty-five per cent, will be entitled to one-half of the balauce of the remaining profits.

It will be seen that the proposed operations of the company are varied and extensive, and the prospects, as set forth hy the promoters, are certainly sufficiently alluring. The capital asked for is £110,000, and if this is promptiy supplied, and if the right men are put in the right place, and wise methods of prooedure are adopted, we do not see why the glowing results anticipated should not be largely realised.—*Electrical Trades Journal.*

TEA GARDEN COOLIES IN ASSAM.

To the Editor of the *Indian Agriculturist.*

Sir,—Many of your readers are no doubt interested in this vast tea district where so many labourers from Bengal are employed, and would like to hear of their condition, and the treatment they receive from the *brutal planter*. First, as regards their pay; women receive on enrolment R4 per month, and men R5 ; after the expiry of 3 years of their 5 years' agreement the pay of women is increased to R5 and of men to R6 per mensem, besldes which they earn on an average from R 4 to 5 per month during the six most husy months of the year hy doing task work after their daily allotted work has been performed. The day before yesterday I found that the coolies on one garden had finished their morning's allotted work by 9·30 a. m. they were consequently free to do what they liked uutil 1 p. m. These rates of pay compare most favorably with the rates receivod during the past year by ablebodied agricultural labourers, as published iu the *Englishman* of 16th May 1890, in Jeypore and Rajpootana, where the average rate was from R2 to 3 per mensem, where rice was selling at 8 seers per rupee; whereas up here it is selling at from 10 to 12 seers, hut the coolies are supplied by the planters with that necessary of life at the uniform rate of R3 per maund, or 13⅓ seers per per rupee, although it invariably oosts the planter more. According to the *Englishman* the highest wages paid to able-hodied agricultural labourers in Oudh was R4 monthly; in the North-West Provinces from R3·12 to 5·8, with a tendency to the lower figure; aud in Bongal proper from R3·12 to 5·10. The coolies in Assam are well housed, and much attention

is paid to the sanitary condition of their lines and houses. When sick, the greatest care is taken of them and kindness shown them. In most of the tea gardens in North Lukhimpore an hotel system of feeding the coolies is carried out * by which, R3 per mensem per adult, and R1·8 per mensem for working boys (children too young to work are fed free) they obtain three meals per diem and as much at each meal as they can eat. In the early morning before commencing work each man, woman, and child is served out with a *chupattee* fried in *ghee*, a quantity of parched rice, and tea at 11 a.m., at which hour work ceases, until 1 p.m., they get a meal consisting of rice, *dhal*, vegetable curry, and tamarind chutnee, which is repeated at 7 p.m.; work ceases for the day at 5·30 p.m. Once a week they get mutton, and one chittack of mustard oil each, with which they *shampoo* themselves. I had the pleasure of seeing yesterday, 500 coolies men, women, and children, assembled in a capacious hotel building eating their mid-day meal; The waiters went round serving out the rice, dhal, curry, and chutnee until all had had sufficient, and refused further helpings. All seemed contented and happy, and on the manager asking them if they had any complaint to make about the food, he received a smile and reply from each man or woman he interrogated that everything was very good. The native doctor, who is much respected by the coolies, is present at each meal. I have noticed that on wet days most of the coolies turn out with good substantial grey blankets, and when working in the sun many of them wear large mat hats protecting their heads and a great part of their bodies. They own cows in great numbers,† and in the lines numbers of fowls and pigeons are to be seen. Without doubt the tea garden coolies are a happy and contented lot, particularly well cared for, and the greatest interest is taken in their welfare by the managers. After the expiry of their first five years' agreement an average of about 90 per cent enter upon a second agreement, which in itself is a sufficient proof of their contentment. Many time-expired men obtain grants of land from Government and open out on their own account. Influenza has been, and is still, rife among them; in one garden 400 were ill with it at one time; few deaths have occurred, and I am happy to say the epidemic is on the decrease. The greatest consideration is shown to the sick, and those in hospital are supplied free with fish, milk, sago, Liebig's extract of meat, &c. On one garden employment is given to two blind boys, and one man who is a cripple. These notes are made, Sir, from my personal knowledge and observation during a visit to North Lukhimpore, and I trust your readers will from a perusal of them consider that the adjective *brutal* does not apply to the Assam tea planter.‡ It is certainly not the opinion of the coolies as can be judged from the following incident. One night a few months ago a manager's house was burnt to the ground through the bursting of a lamp; he lost everything to his name. All his coolies came forward offering him money; he was presented with a watch, wearing apparel, numerous other articles. With these facts before them surely Government can see its way to modifying Act I of 1882, which quadruples the cost of the passage of coolies up here; but for this Act coolies could be comfortably landed at Dehrughnr at from R20 to 30 per head, whereas they now cost the planter from R80 to 100. The planters could then no doubt recruit in Jeypore, Rajputana, and the N. W. Provinces and thus help to ameliorate tho condition of the nnderpaid and undorfed labourers of those provinces.—VETERAN.

* We have frequently suggested some such system for Ceylon estates, but we suppose the curse of caste stands in the way. In Government hospitals, however, the obstacle is overcome, high caste cooks being, we believe, employed.—ED. *T. A.*

† This could not be managed on Ceylon estates, where only the conductor and a few kanganies generally have cows. The Indian estates are sometimes of large area, including grass and rice fields.—ED. *T. A.*

‡ The whole class suffer in reputation from the undoubtedly brutal conduct of a few "black sheep." Of the latter Ceylon has known some.—ED. *T. A.*

PROSPECTS FOR A NEW LOCAL INDUSTRY:

MAANA AND CITRONELLA GRASS FOR TEA BOXES.

Referring yesterday to the deterioration of our teas due to packing in chests made of unseasoned wood, we touched upon the prospect of an efficient alternative to the use of such wood afforded by the patent now being worked by the Stanley-Wrightson Syndicate. We said that this patent was still awaiting approval or condemnation, and we are not even to date able to say what the nature of the verdict upon it is to be. But intelligence conveyed to us in our London Letter to the effect that mana grass has been successfully applied to the manufacture of the board which forms the main constituent of the new chests must make us desirous to learn that the character of that verdict, when given, may be a favourable one. For, if it be so, there seems to be every chance, according to what our London Correspondent writes, that we may see established in this island two factories to undertake the making of the new material from what are now almost entirely waste products of native growth. With these would of course also be included workshops for the manufacture of the chests, which have as yet been made only at the trial factory near London.

The two items among our local products which have as yet received special mention are the mana grass which grows so freely in Ceylon and the citronella stalks which are now left as refuse after oil has been expressed from them. The first of these has already been subjected to successful trial at home, and our Correspondent has forwarded to us a small sample piece of the thick fibrous paper, resembling millboard, which has been the result of that trial. We are assured that so good an authority as Dr. P. Norman Evans, the expert of the London Paper Makers' Association, has declared as the result to his experiment that mana grass offers a more than efficient substitute for wheat straw; that it is, in fact, owing to its containing less of the silicate which is so potent a factor in producing brittleness, much more suited to the manufacture of the boards required than is the last-mentioned material. One has only to handle the specimen of the outturn to Dr. Evans's experiment to realize how far more flexible and homogeneous it is than anything we have yet seen produced from straw. Further trials, we are told, are to be made by Dr. Evans, and if these result in confirming first impressions and an official report to that effect is made by their conductor, it will be determined upon—contingently of course upon a favourable opinion being expressed as to the general suitability of the new tea chest to the needs of our tea planters—to establish factories for the manufacture of the board both at Galle and Nawalapitiya; the first to undertake the working up of the waste from the citronella oil mills, and the second that of the mana grass which is to be found in such abundance in its neighbourhood.

We shall naturally be well-disposed to welcome the establishment among us of these two new factories, with, we should presume, their included industry of the making up of tea chests of the

material they are to furnish. All work of the sort contemplated requires the employment of great power. This could doubtless be obtained very economically by the use of the almost unlimited water power which can certainly be obtained in the neighbourhood of Nawalapitiya, and possibly also near to Galle. Mr. Stanley assured our correspondent that, given favourable results to the two experiments now proceeding, all arrangements were well forward to start the industry in this island, and we therefore look forward with very great interest to receiving the subsequent report which will doubtless soon be forwarded to us. It appears that the present cost of carriage of each box from London to Ceylon is sixpence, and therefore on this item alone a very considerable saving will be effected if the chests can be locally produced. But it is confidently anticipated, that beside that economy, a further one of very considerable amount will attend the local production of the strawboard This has hitherto been obtained from Holland, but experts consider it to be of imperfect manufacture, and it is besides relatively too expensive. The change contemplated will therefore, if carried out, probably render it possible for the chests to be supplied at a cost considerably below that of the wooden boxes at present used.

We have referred above to what is termed the imperfect manufacture of the strawboard at present used. We are told that in order to obtain the required stoutness—*i.e.* thickness—of board several layers of the straw paper have to be pasted together. It is presumed that the siliceous character of the straw used opposes itself to the production of thick material. This difficulty, it is said, will not present itself in the case of manufacture from mana grass, and that, given sufficient power, it will be possible to make from it board of almost any required thickness. Although as yet the prospect of this new industry being established among us is still subject to conditions which may possibly not be fulfilled, there certainly appears to be very strong ground for hoping that before very long we may be able to welcome its advent.

It will certainly be a remarkable change, if the tall, course, lemon-scented grass which covers so large a portion of our upland prairies, instead of being burnt periodically to obtain cattle feed in the shape of the young tender shoots, should be cared for, cultivated and utilized for an interesting and profitable manufacture.

HOME CRITICS ON CEYLON TEA: OVERFIRING AND FERMENTATION. TEA CHESTS.

Having asked Mr. F. F. Street's opinion on this subject he is good enough to write as follows:—

"In regard to the firing of tea, of course you allude to Messrs. I. A. Rucker & Bencraft's recent circular on this subject. I can only say that I entirely agree with their remarks as far as the fermentation and firing of Ceylon teas is concerned. My estate reports during the past five years would give you ample evidence that what they assert is perfectly true, and they confirm what I have repeatedly written on the subject during that period. During the past six months alone I may mention that I have reported on something like 1,200 estate samples, so that I have had ample opportunities of judging. This does not, of course, include teas that have come under my notice in other ways, and as a buyer and seller of tea on this market, I am perfectly convinced in my own mind that insufficient fermentation and overfiring in a great measure, if not entirely, account for the non-keeping properties of Ceylon teas—of which we have heard so many complaints. I am however glad to say that the number of cases of overfired teas coming under my notice in the way of business are much less numerous than they were—this is largely due to the firing now being done at a lower temperature than formerly, especially the final-firing—which in most cases is where the damage is done. It appears to me that tea is exactly on a par with any other article of food that requires roasting before it is fit for consumption: it may and often is cooked to such a point of dryness that the sap or juices are more or less burnt out of it, leaving a dry juiceless article, deprived of all its quality and goodness. It is a noteworthy fact that under or short fired teas are invariably full and generally pure in the cup, while overfired teas are always more or less impure, thin or comparatively so; clearly proving that the additional firing has dissipated some of the juices of the leaf that would have remained in the leaf with slower and lower firing.

"*Tea Chests.*—I have not the smallest doubt that the 'cheesy' flavour complained of from home, originated from the use of some unseasoned and unsuitable Ceylon wood. Some two or three years ago I had some shelves put up in my office made of a cheap Ceylon unseasoned wood, the smell was perfectly offensive (I can only liken it to 'rotten game'), and made it most unpleasant to sit in the same room.

"Japanese 'Momi' are undoubtedly the best packages we have, being free from smell, light of weight and for make and finish rarely equalled in Ceylon-made packages."

We can understand underfermenting leading to absorption of moisture, but how over-firing can lead to such a result, we find it difficult to conceive.

MAURITIUS HEMP MACHINES.

(From the *Kew Bulletin.*)

The subject of Mauritius hemp has been discussed already in the *Kew Bulletin* (March 1887, p. 8). Since that time considerable interest has been taken in India and the Colonies in the production of fibres suitable for rope and twine making, for which of late years there has been a considerable demand. In connexion with this interest numerous inquiries have been addressed to Kew respecting the best machines for cleaning the leaves and stems of plants yielding such fibres. The plants in most cases have been various species of *Agave, Furcræa, Sansevieria, Karatas, Bromelia,* and other monocotyledonous plants whose fibre bundles yield the particular kind of fibre in demand.

It is well known that certain fibre machines, more or less effective, are in use in Yucatan in the production of Sisal hemp, yielded by one or more varieties of *Agave rigida.* It is very probable that some of these machines could be successfully introduced into other countries where Agave plants are grown for fibre [*see* Kew Bulletin, March 1887, pp. 3-8; March 1889, pp. 57-61; and October 1889, p. 254].

In the case of Mauritius hemp we learn that the fibre machines, locally known as *grattes* or scrapers, which have been generally in use in that island for many years, are manufactured in the Colony. These are exclusively engaged in extracting fibre from the leaves by the *Aloës vert* or fœtid Aloe (*Furcræa gigantea*). The leaves of this plant are very similar in size and character to those of *Agave rigida* var. *Sisalana* received lately at Kew from the Bahamas. There is little doubt that the *grattes* or fibre machines as now used in Mauritius, or with some slight modifications, could also be used in the treatment of Agave leaves. In any case it was very desirable to obtain exact particulars of

the constrnction and capabilities of the Mauritius machines. They appear, so far, to fully meet the requirements of the Mauritius planters, and moreover, they have been adopted after careful trial with other machines which have been ultimately discarded. The particulars desired in regard to the machines in use have now been furnished in an exhaustive manner by the Government of Mauritius, and they are published in the *Kew Bulletin* with the view of placing the information within reach of a large class of people interested in the subject.

* * * *

Answers to queries respecting machines in use at Mauritius fer extracting fibres from leaves of *Furcræa gigantea.*

1. The machine in general use in this Colony is a drum of 2 feet in diameter by 1 foot in width, upon which are bolted blades in 2-inch L steel, and which revolves at a great speed, the blades passing close to a guide in cast iron ("servante.") The machine is called a ("gratte") scraper. It is manufactured in the Colony by all engineers' shops, but chiefly by the "Forges and Fonderies de Maurice."

2. The weight of the drum is about 4 cwt., the cost, including the driving pulley and belts (exclusive of framework, masonry, and setting,) is about R250 per "gratte."

3. This gratte has been in general use in Mauritius for the last six years.

4. The machine is worked by steam or by water power.

5. The registered horse-power to drive one gratte is 3 h.p.

6. One gratte is served by two men who stand on each side of the gratte, and who work alternately. One of them must be left-handed. One carrier will bring in sufficient leaves from the yard to the gratte, and another man will suffice to remove the wet fibre produced by two grattes and to carry this fibre to the weighing machine and thence to the cleaning pits.

7. The out-turn of wet fibre for each machine per hour is, on an average, 42½ kileg., that is taking eight hours' work per day, which is as much as the men can do, the work being very fatiguing.

8. The out-turn per day of eight hours is per machine (gratte) 340 kil. wet supplying on an average 97 kil. of dry fibre (or 28½ per cent of the wet fibre.)

	R
9. The average cost in labeur, fuel, &c. in cleaning a ten of dry fibre, packing, and transporting to the place of shipment is ...	150
If to the above we add other charges, viz., collecting leaves, carting, mill management, interest on capital, &c., say about	75
The total average cost of one ton of fibre ready for shipment is	R225

(Signed) A. VANDERMEERSCH,
Acting Surveyor-Genl.

17th February 1890.

SUMMARY OF A NOTE ON THE FIBRE MACHINES GENERALLY IN USE AT MAURITIUS FOR ALOE CLEANING FIBRE, BY M. REGIS DE CHAZAL.

1. *Description of Machine.*—The machine generally in use in Mauritius for extracting fibre from the leaves of the green Aloe *Furcræa gigantea*) is known under the name of *gratte.* This gratte consists of a drum about 2 feet in diameter and 1 foot wide. On the circumference of this are bolted 2-inch L-shaped blades parallel to the axis. These blades are generally of iron, bnt steel is preferred. They are firmly fixed te the drum by means of bolts and nuts. The drum is mounted upon an axle and made to revolve with great rapidity close to and against the front or edge of a feed table (*servante*). The feed table is adjusted by means of screws so as to approach the revolving drum within a distance of quarter inch to an inch, as required. It is composod of a stout brass plate and lip fitted firmly to a piece of hard wood by means of bolt. The plate and wood are themselves fixed to two wooden bars, 6 inches by 6 inches, which serves as guides in the movement of tho feed table backwards and forwards.

The most difficult task in connexion with working the gratte is the exact adjustment of this feed table. It is most necessary that the blades on the drum and the edge of the feed table are so adjusted that they work freely and evenly and at the same time bring every fibre in the leaf in contact with the beaters. The proper adjustment of the feed table in regard to the beaters is stated to be the secret of the success of the *gratte* as a fibre machine. This adjustment should be performed with the utmost care before the machine is started. When once adjusted it is important to maintain the feed table in its proper position and prevent any displacement during the process of working.

The drum should be turned at an average rate of 700 revolutions per minute, while a higher rate of speed may be maintained without injury, it is found not desirable under any circumstances to fall below 620 revolutions per minute. The best and most economical work is that done at 700 revolutions per minute.

Method of Working.—The Aloe leaf is presented tip first along the feed table, and is drawn down between the latter and the drum. It is thoroughly beaten by the grattes to about three-fourths of its length. By these means the pulp is removed and the fibre is left. The leaf is then withdrawn and the other end presented to the beaters until the whole is cleaned.

Two men usually work at each machine. They stand one on each side of the feed tablo and work alternately. It is desirable for rapid work that one of the men should be left-handed. Each man in turn presents his leaf to the machine and withdraws it as soon as possible. In a regular and efficient working of the machine it is arranged that one man or the other should always have a leaf in the machine in course of being cleaned. To avoid accidents the feed table is now provided with a wooden guard. This guard prevents the hands of the workpeople from being caught by the beaters.

Mounting the Machines.—The machines are generally mounted in pairs beth working on the same axle, and driven by steam or water power. The driving wheel fixed midway on the axle between the two machines should have a minimum diameter of 18 inches, with a strap 6 inches wide. A single adjustment of the feed table should last from eight to 15 days. At the end of that time it is generally found necessary to readjust the pasts to ensure good results.

The framework of the machine is securely attached to substantial masonary work by large bolts about 5 feet long. The machines must be thus firmly secured or the vibration during the process of working would soon cause them to be come detached. The arrangement of the machines in pairs on the same axle could be extended in the same line indefinitely, provided the necessary distance is preserved between the centre of each machine. One of the largest fibre factories in Mauritius contains 12 machines, that is six pairs arranged as already described.

Out-turn of Fibre.—As already stated each machine is served by two men standing on each side of the feed table. One carrier supplies them with fresh leaves while another is engaged in receiving and removing the wet fibre. The task of a man, which can be easily accomplished in six to eight hours, is 250 lb. (or 125 kilos of wet fibre). The wage paid for this is one rupee. Sometimes, however, by extra work (for which the werkman is paid at the rate of 50 cents per 100 lb). as much as 800 to 900 lb. of wet fibre have been produced in a single day. This amount amount, however, is quite exceptional.

The proportion of dry fibre to the wet fibre as it leaves the machine varies from 22 to 30 per cent.

The yield of dry fibre in relatien to the weight of green leaves varies according to the age of leaves and the characteristics of the season. The riper the leaves tho larger the yield of fibre; a wet season producing leaves charged with moisture will also affect the result. To produce a ton of dry fibre ready for shipment requires from 80,000 to 150,000 leaves, varying according to the size and age of the leaves and character of the season. The cutting of the leaves costs from 50 cents to one rupee tho 100 bundles of 25 leaves each. The higher price is paid when labour is scare, or when the

ground is rough and difficult to traverse. The cost of baling the dry fibre costs from 40 to 50 cents the bale of 150 kilos. It may be assumed that a set of 10 to 12 fibre machines properly installed and attended by men accustomed to the work will turn out on an average about 1,200 kilos (2,645 lb. avoir.) of dry fibre per day.

Difficulty is sometimes experienced in obtaining pairs of right-handed and left-handed men for each machine. Right-handed men are, as may be expected, in excess. As already shown, it is necessary for economical working to have a right-handed and a left-handed man to attend to each machine.

Treatment of the Fibre.—When the fibre first leaves the scraping machine it is covered with mucilage possessing corrosive properties which dries on exposure to the air. The tendency of this mucilage, if left on the fibre, is to turn it of a yellow colour, and even sometimes of a reddish colour. To prepare the fibre with a bright attractive appearance the best plan is to place it, as soon as it leaves the machine (or as soon as it has been weighed, to check the amount produced by each man), in warm water of a temperature of 60 deg. to 80 deg. Cent. (140 deg. to 170 deg. Fah.), and leave it there for about two hours. It should then be washed in two waters, and finally exposed to the sun to be dried.

A treatment recently employed consists in washing the fibre in cold water only. In the first washing soap is used at the rate of 2 to 3 per cent. of the wet fibre. After being thoroughly washed with soap the fibre is passed through pure water until all the soap has disappeared, then exposed to the sun and dried. By these means a beautifully white fibre is obtained. When thoroughly dried the fibre is afterwards scutched, to get rid of pith and dust. This process is usually performed by a machine constructed on the plan of an ordinary *gratte*, but fitted with four blades instead of 12. These also turn away from the feed table instead of towards it. The fibre is inserted at an opening about 6 inches higher than the centre of the axle. It is carried away by the movement of the beaters, and remains on the top of the drum, where, exposed to the repeated blows of the beaters, it is cleaned of all dust and impurities.

It may be mentioned that, owing to the corrosive nature of the juice of the Aloe leaves, the workpeople are compelled to wear strong leather gloves. The gloves are fastened to the wrist by leather bands. As the gloves are provided by the proprietor, and they wear out very quickly, they constitute quite an appreciable item in the cost of working a fibre factory.

Addenda.—The upper half of the gratte is covered with a semicircular wooden cover, to prevent the "pulpe" from being splashed about the place; this "pulpe," which is semi-liquid, falls on an inclined plane standing about 1 foot below the gratte, and upon which it slides into troughs, wherefrom it is gradually removed and spread to dry.

There is a considerable quantity of this "pulpe" produce for one ton of dry fibre (about 20 tons), and large areas are required to stack it. The smell from the decomposing "pipe" is anything but agreeable.

During the first years of Aloe fibre manufacture in Mauritius no use was made of the residue ("pulpe"), as it was found to burn the plantations when used as manure. Of late, however, it has been extensively employed by mixing it with other manure, and it has given good results in the cane fields.

(Signed) A. Vandermeersch, Acting Surveyor-General
February 17th, 1890.

Statement of Work executed at St. Antoine Hemp Factory, in District of River du Rempart, Mauritius.

Year 1889.

February	...	15 days' work with	9 grattes.	
March	...	18	„	11 „
May	...	20	„	11 „
June	...	7	„	11 „
		60 days.		

Equivalent to 630 days' work of one gratte.

The produce has been 213,371 kilos. of wet fibre, which have given—

401 bales of dry fibre, 1st quality.
6 „ coarse fibre, inferior quality.

407 bales, weighing 61,050 kilos.

Mean day's work = 10,175 kilos.
Proportion of dry fibre to wet fibre = 28·61 per cent.

A true copy of note supplied by Manager. (Signed) A. Vandermeersch, Acting Surveyor-General.
17th February 1890.

BRAZIL AND THE RUBBER TRADE.

"So the swooping down of the new Republican Government upon the rubber exporters at Para, has given the trade rather a twinge," said one of our representatives to a leading London importer the other day. The air was redolent of rubber, and before our reporter had had time fully to enjoy the flavour, the broker answered:

"No; say rather a spasm. But it is all over now. The Central Government at Rio has stopped the action of the Provincial authority which gave the monopoly to the Companhia Mercantil."

"You did not have to wait for the memorial to Lord Salisbury to take effect. Diplomacy is at the service of the City. Fifty or sixty firms importing yearly 6000 tons of rubber from Brazil always have ambassadors and ministers plenipotentiary at their beck and call."

"No doubt the Government would have acted in the question. But it is not necessary now. The French claim the credit for the abolition of the monopoly. That really does not matter. What we feared was that the new movement would not stop at caoutchouc. It might have treated coffee in the same way."

"Still, prices have been affected but very slightly by the monopoly."

"That is so. But the principle of the Republican Government's action was most unfair. All exporting houses in Para were compelled to pay a large percentage to one company, which in its turn was favoured with the monopoly by paying a very small tax per pound on exports. One of our chief complaints was that the additional taxation was payable not to the Government but to a private trading corporation which competed with the payers of the tax in the rubber trade. It was not business. It was sheer barbarism."

"So the new Government has not made a good impression!"

"No; but it has been taught a lesson, and may be expected to do better in future. It will reflect before it attacks the mercantile interest again."—*British Trade Journal.*

CONCRETE QUARTERS FOR NATIVE CLERKS, GUARDS, AND MENIAL STAFF ON INDIAN RAILWAYS, etc.

By T. Ker, M. Inst. C. E.,
Executive Engineer, P. W. D.

The excessive cost of housing the Native Staff, owing to the necessarily, and by comparison with European Railways, large number of native employés required, has long occupied the serious consideration of Railway Administrations in India. The above difficulty, in effect, has led to temporary structures being resorted to in many instances, the repairs to which, every monsoon, cost in a few years more than permanent quarters could be erected for.

The author having had some experience in the designing and construction of various descriptions of dwelling houses in India, has, with the object of meeting the exigencies of the case, designed, a class of quarters suitable for native clerks, guards, platelayers, pointsmen, gatemen, &c., the lower state generally, for which he claims the following advantages:—

1. The quarters being built of concrete throughout, walls and arched roof, can be erected almost anywhere.
2. The materials, lime, sand, broken stone, or brick or kunkur, are nearly everywhere procurable locally.
3. Very little skilled labour is necessary.
4. The cost is one-half that at present paid for the same area of stone or brick-built accommodation.

The quarters are water-tight and, if properly constructed, should never require repairs; those erected some years ago having withstood every test. The natives prefer the above, as being cooler than stone-built houses.

The style of construction adopted is specially suited to the natives, who are accustomed to light work, progressing by easy stages; it has also this advantage that, with the usually scanty supervision available in India, the due inspection of each course laid, is rendered possible, less opportunity of inferior materials being passed and a better guarantee secured that the work will be substantially carried out, than would result if European methods were pursued.—*Indian Engineer.*

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

LONDON, June 5th.

CINCHONA.—The auctions held here on Tuesday were the smallest which have taken place for many months, the total weight of the bark offered being less than two-fifths of what is announced for sale in Amsterdam on Thursday. The assortment of bark offered was rather a good one, one or two catalogues offering several very handsome parcels. The tone prevailing at the auctions was a very strong one indeed, and though it cannot be said that there was any actual alteration in value, the lots sold were well competed for, and holders showed no inclination to accept lower rates.

The following was the assortment offered:—

	Packages.		Packages.	
Ceylon bark	...562	of which	...243	were sold
East Indian bark	...312	"	292	"
Java "	... 11	"	11	"
South American bark	...634	"	122	"
Total	...1,519	"	668	"

The unit is generally placed at 1⅝d to 1¾d per lb.

The following were the principal buyers:—

	Lbs.
Agents for the American, French, &c., works	...28,314
" the Brunswick works	...19,819
" the Frankfort o/M. and Stuttgart works	...11,580
" the Auerbach factory	...14,390
Mr. Thomas Whiffen	...18,410
Agents for the Mannheim and Amsterdam works	...22,215
Messrs. Howards & Sons	...26,109
Sundry druggists	... 2,560
Total amount of bark sold	...153,397
Bought in or withdrawn	...276,000
Total quantity of bark offered	...429,397

It should be well understood that the mere weight of bark purchased affords no guide whatever to the quinine yield represented by it, firms who buy a small quantity of bark by weight frequently taking the richest lots, and *vice versa.* Analysis of the catalogues gives the following prices for sound bark:—

CEYLON BARK.—Original.—Red varieties: Fair to good quilly chips 2d to 3d; rather dusty, but bright shavings 3½d; bold and dusty mixed root 2½d to 3d per lb. Yellow varieties: Good bold quilly chips 7d to 8½d; small branchy chips 5d; bright, but dusty mixed chips and shavings 7d; dull, but rich root 7½d to 9½d; low pale quillings 3d per lb. Small and dull grey chips 2½d to 3d; dusty to bold root 4½d to 7d per lb. Hybrid chips, small and dusty to good strong 3½d to 6d per lb. Renewed.—Red varieties: Sall woody chips 3d to 4d; good bright and mixed with small quill 4½d to 6d; fine bright shavings 7d per lb. Grey: Good chips 6d to 7½d; fine bold bright quilly ditto 8½d to 9d per lb. Hybrid chips 5d to 7½d per lb.

EAST INDIAN BARK.—Orgnl.—Red varieties: Small to fair quilly mixed chips 2¼d to 3d; fair bright shavings 3½d; dull weak branch 1¾d; dusty root 2½d per lb. Yellow chips, dull and small 3½d to 4½d; good bold bright ditto 5d to 6d; good bright quilly shavings 5d per lb. Grey quilly chips 4½d to 5d per lb. Hybrid chips 4½d to 5d; fine bright shavings 6½d per lb. Renewed.—Red varieties: Small and dull to fair quilly stem chips 3½d to 5½d; good bright, but small shavings 5½d per lb. Yellow chips good quilly to fine bright strong 6½d to 10d per lb.

SOUTH AMERICAN BARK.—Of 32,336 lb. cultivated Bolivian Calisaya 12,110 lb. sold; good strong brown and grey quill 9½d; medium ditto 7d to 7½d per lb. A parcel of 34 serons old dull dusty Pitayo sold at 3½d per lb., and of 321 packages Cuprea 47 bales imported in 1883, sold at 2½d per lb., the remainder being held for 3d to 4d per lb. The imports here are rather heavy, 1,316 packages having been entered from all quarters since our last report. We understand that over 200 packages bought in at Tuesday's auctions have since changed hands at full prices.

QUININE.—The speculative business has continued during the early part of this week on a moderate scale, about 50,000 oz. B & S and Brunswick bulk, first-hand changing hands at 1s 1¾d for November-December, and 1s 1¾d per oz. for August-September delivery. The A & S agents now say that they do not care to sell any more, and quote 1s 2d per oz. nominally. Meanwhile the market has become inactive, and the position today is about as follows:—Spot: Buyers 12½d; sellers, 13d; August-September, buyers, 13d; sellers, 13¼d; November-December buyers, 13¼d; sellers, 13½d per oz.; no business.

THE AMSTERDAM CINCHONA AUCTIONS.

(*Telegram from our Correspondent.*)

At today's auction 3,082 packages were offered for sale, and these were all disposed of with the exception of 5 packages. Holders offered freely, and the result of the heavy quantity thus pressed upon the market was a decline of fully 10 per cent as compared with the previous Amsterdam sales, and some slight fall on the last London prices. The average unit value was fully 8 cents per half-kilo, or a fraction below 1½d per lb. The following prices were realised: manufacturing barks in quils, entire and broken, and in chips, from 4 to 78 cents (= ⅝d to 1s 2d per lb.); manufacturing root 11 to 64 cents (= 2d to 11¾d per lb.) Druggists' barks, chips and quills, broken and whole, 11 to 78 cents (= 2d to 1s 2d per lb.); ditto, root, 12 to 25 cents (= 2d to 4½d per lb.) The principal buyers, in order of their purchases, were Messrs. Mathes & Bormeester, of Amsterdam; Messrs. O. L. Schepp & Zonen, Rotterdam; the Auerbach Quinine Works and the Amsterdam Factory.

In addition to the analyses of the bark offered today, already given in last week's issue, the remaining 48 tons of bark were found to contain about 2 tons sulphate of quinine, so that the whole quantity of manufacturing bark offered today, viz., about 246 tons, contained about 335,000 oz. sulphate of quinine, or about 4 percent of the average.

ARTIFICIAL GUTTA-PERCHA.—We are informed by Dr. Purcell Taylor that he has succeeded in making a new insulating material, having all the properties of gutta-percha. The new substance is very tough and elastic. A piece of iron covered with this "Purcellite" was, he states, hammered out flat, then bent and twisted until it broke, without even cracking the covering. The cost is said to be considerably less than that of gutta-percha.—*Electrician.*

THE CULTIVATION OF CINCHONA IN SOUTHERN INDIA.

We call attention to Baron von Rosenberg's long, racy and practically interesting letter addressed to the "Editor of the *Tropical Agriculturist*" given in another column. We have not seen a copy of Mr. Lawson's report, which our correspondent so trenchantly and so ably criticizes; but before reading this letter we had written a note on the reference to Mr. Lawson's starvation theory in the report of the Wynaad Planters' Association, to this effect: "Surely stiff, damp, clayey, soil is a largely operatively cause?" In our own experience, which has been extensive, we have traced canker in cinchonas to soil mechanically hard more than to any other source. The taproot of cinchona cannot pierce soil in such a condition, but curls round in the pit, and such roots we have found covered with liverworts. Through similar soil the much hardier tea plant forces, its robust taproot, to a depth of many feet, and we have frequently mentioned that in land thus opened up and drained by tea we have thriving (for the tea far too luxuriant) groves of cinchonas. If, therefore, it were commercially worth while to continue to cultivate cinchonas in Ceylon, we should advise putting the plants out amongst tea at least four years old. Even so, no doubt, many of the plants would gradually canker and die, as in the case of cacao, the zone for cinchonas seems limited, and amongst all that is worthy of attention in Baron von Rosenberg's remarks, and that is the whole of his utterances, we attach special importance to his advice that cinchonas should not be planted under 5,000 feet elevation. But if any new plantations are to be formed in Ceylon at and above that elevation it must be on grass-land, for the Ceylon Government will not, now, sell forest land above 5,000 feet altitude, lest, forsooth, the rainfall (dependent upon monsoon winds and mountain masses) should be diminished by forest clearing! All the clearing as yet effected has not diminished the rainfall a thousandth of in inch.

PLANTING IN THE SOUTH PACIFIC.

We have a letter from a New Zealand mercantile house inquiring about planting requisites in various forms, and from their manager—an old Ceylon planter—resident on an out-of-the-way island of the Pacific, who writes:—"I have recently arrived here on behalf of the firm of ——— to look after their coffee plantations. The island is a very small one and grows coffee luxuriantly, but it is almost all old and, like the native coffee of Ceylon, never touched by pruning knife. The firm is about to put some land under coffee after the Ceylon method of cultivation. I think of introducing some other products here which I think ought to succeed,—cacao, Liberian coffee, cardamoms and pepper. I should like also to introduce the jak tree."

TIMBER FOR MINE PROPS.

In view of the probability that large demands on our forest resources may ere long be made by gemming and plumbago companies in the shape of props for mines, the following details from the *Indian Engineer*, of experience in coal pits at Warora, may be interesting and useful:—

All the timber used is in the shape of props cut in the Government preserved forests, near Chanda, about 30 miles south from Warora. Timber in India is very expensive; teakwood costs 3½ rupees a cubic foot, and is the only timber available for ordinary work. Before 1883 very few props were used, and it was only on the introduction of a regular system of working and commencing the broken mine that the getting of timber on a large scale was gone into. In January 1884, the Government Forest Department sent six sorts of timber, in the shape of props, for trial, the principal variety being Garrari (Lepidopteris orbicularis), of which the props upto that time had been. The others were Thendu (Diospyros melanoxylon), Dhaora (Anogeissus latifolia), Mohka (Schrebera Swietenoides), Aouli (Phyllanthus emblica), and Seena (Lagerstroemia pariflora). Of these, Garrari was given up later, after trials with it in the pit; its wood is too fibrous, and it was found too flexible, and very often hollow. Thendu was found to be the best; it has as heart wood, ebony, and was found to answer well as a prop in the broken. Dhaora was found to be the next best, but its curious structure, in which the fibres looked like the twist of the strands in a hemp rope, made it less fit to stand pressure. Mohka was found to be a fair timber, while Aouli and Seena was pronounced bad. Unfortunately a large number of Garrari props had already been ordered, and they became of use by being split and used as lagging; Garrari is also more plentiful than other timber, being a quick growing tree. After this, two sorts only were ordered—Thendu and Dhaora with a little Garrari. Then the Forest Department complained that at the rate of consumption, the timber preferred could not be supplied without endangoring the existence of the plantations, and asked that some other kinds of timber be tried for pit props and accordingly, a further assortment came and were tried. They were:—1.—Rohan (Soymida febrifuge). 2.—Saj (Terminalia tomentosa); locally known as Ain or iron wood. 3.—Mohka (Schrebera swietenoides). 4.—Suria (Xyla dolabriformis). 5.—Bahera (Terminalia bellerica), 6.—Kahu or Argun (Terminalia arjuna); rather rare. 7.—Kini (Albizzia procera). 8.—Bhirra (Swietenia chloroxylon). 9.—Chichwa (Albizzia odoratissima); not recommended by the Forest Department for pit work. 10.—Mohwa (Bassia latifolia), not recommended by the Forest Department for pit work. Of all these specimens, Saj was the only additional timber recognized as good for mining, and accordingly from that date (1886), two sorts of props only were indented for Thendu and Saj. In 1888 the Forest Department complained again that if the colliery would still insist on being supplied only with two sorts of timber in such large quantities—about 5,000 props per annum, from 8 feet to 14 feet long. by 8 inches to 12 inches in diameter—they would be unable to keep up the supply, and again asked that other timber should be tried, and in November, 1888, eight samples were sent, of which three had already been tried, the others being—Bhirra or satinwood (Chloroxylon Swietnia), Kate or Kase i (Briedelis retusa), Hiwar or Kinj (Acacia eucophlea), Siras (Albizzia lebbak), Keni or Gorarh (Albizzia procera,) and here the question stands. There is no doubt that the panel system of working, and the careful seeing to that no more than 8 feet of coal is worked in the whole mine, and the galleries kept their ordered width, and the narrowing of the boards of the headways, will still reduce the cost of timber per ton, especially when the broken is commenced in the large 60 feet pillars. The cost could be brought down to 1½as. or 1¼as. per ton. The timber for props should be cut in or before the rains, and after barking, allowed to lie two or three months in the jungle.

THE CHINA TEA TRADE.

The *Shen Pao* attributes the decline in the Tea Trade to the following causes. First foreign competition and secondly, the machine-made tea of India and Ceylon besides being nearer to the tea-consuming countries, cost far less to produce than China tea. Several large hongs engaged in the tea trade lost heavily on last year's crop, but for all that there were in Kiukiang alone, something like 33 hongs engaged in the trade on the year's first crop, no doubt with varied luck,

But in the second crop there were only 6 or 7 hongs engaged. The question is why is there this great dropping off in the second crop. The answer is to be found in the above reasons. But there is still another, and the greatest reason of all. It is the heavy duties levied by the Government on the article. The dealers are compelled by the enormous taxation to abandon the trade. Formerly when a picul of tea cost Tls. 50 or so, the duty was fixed at Tls. 5; but in consequence of the lowering of prices a picul of tea of the ordinary kind costs only Tls. 8 or 9, and of course on this the traders cannot afford to pay a duty of Tls. 5. There is no proportionate lowering of the duty with the lowering of prices, and unless the authorities take timely measures to redress this, the trade that has for so many centuries been the staple of China will be utterly ruined.

It is rumoured that on her last trip the *Whaon* carried a lot of fire bricks and all the necessary plant of tea manufacturing machinery destined for Kiukiang. It is to be hoped that by this the Chinese may be enabled to compete in the trade with other nations.—*China Mail*, June 12th.

PLANTING IN FIJI.

Alpha, Fiji, May 15th.

We escaped a blow this past season, for which everyone is thankful and feels more hopeful for the future. The plantations, coconut, have not yet recovered from the disastrous effects of the 1889 hurricane, and it will take some 2 or 3 years more ere they will give any return to speak of and even then they will not give the crops they used, as such a large percentage of the trees have died. The Colonial Sugar Co. are talking of putting up a mill in Vanua Levu on the Labasa. They have been taking levels of and surveying the land. Most probably they will first try 100 acres of cane, and if it grows and turns out well then launch out further. That old Ceylon planter Cottam has been up this way and spent some time with me. The country was not go-ahead enough for him, so he has cleared out to New Zealand.

Tea is looking A 1, but the crop has not been up to expectation on account of incessant rain for 5 months. I am hoping for better things this season. Prices of tea in the Colonies are very poor. Lanyon, an old Ceylon man, has gone to Sumatra to try and learn all about tobacco. He will return here, *i. e.* Fiji, to show us all how to do it. The colony grows good tobacco, but no one knows the secret of curing. Coolies can now be got for about £18 to £19 from India instead of costing £25 as formerly. The introduction of Polynesians is still heavy, £15. The Government is now prepared I hear to lease out land at a cheap rate and for lengthened periods. I am in a hurry to catch the mail, so must defer writing to you more fully on the labour and land questions till some other time. Wishing the Old Colony all prosperity.

A. J. S.

THE JAVA TRADE.

Though Java grows rice, tho quantity raised does not meet home consumption, and yearly importations, more or less considerable, have to supplement local crops. The importation of petroleum has increased five-fold within the last fifteen years in Netherlands India. There, the average consumption per head of the population comes to four times the percentage in British India. The extension of steaminnavigation and railways of late years takes effect in steadily arger arrivals of coals from foreign lands. The export of sugar has fallen off a good deal. The coffee totals come to 370.000 piculs, which compare favourably with those for 1888. The figures for indigo mark steady and growing increase, a feature common to few Java export articles. It has doubled within the last twelve years, and commands so much favour that many planters put that staple above sugar. The exports of tobacco remain stationary owing to the low prices ruling in Holland, and very little of the article finds its way to Singapore. Hides present the same state of matters but nutmegs and mace show a decline, hardly any being grown in Java. The same may be said of pepper, the quantities figuring in the trade returns coming for the most part from the Lampong districts, where its cultivation is a leading industry among the people. Jungle produce makes little show, gum dammar lessening in importance. and india rubber and gutta percha steadily figuring less and less. The yield of tea grows slowly compared with the leaps and bounds characterising its production in Ceylon and India. Cinchona shows more than 40 per cent increase, and kapok compares favourably with the figures in the returns of ten years ago. Decrease is noted under the head of rattans but the article comes from Sumatra and Borneo, Java itself being a non-producer. As will have been seen Java still holds a commanding position in the market, and may be trusted to recover ground when the times mend.—*Straits Times*, June 11th.

MAANA AND CITRONELLA GRASS FOR STRAWBOARD—TEA CHESTS—FIBRES.

A good deal was written you in my last letter about the prospect of successfully substituting mana grass and citronella stalks for the straw which is now worked up into strawboard, and the possibility arising from that prospect of the establishment of factories in Ceylon to give effect to it. Since writing you to that effect Dr. Evans and Dr. Wirtz have conjointly sent in a report upon further experiments conducted by them which opportunity has been afforded me to read. Analysing this report, it appears that when boiled under pressure with water alone mana grass yields about 50 per cent of fibre; but as of course these experiments have been made with grass that has parted with nearly all its moisture during its conveyance to this country, this percentage would not represent the proportion that could be obtained from the grass gathered wet for local manufacture. The addition of certain proportions of lime during the boiling process appears to have been possessed of but little value; while an experimental admixture of soda, made with the view of bleaching the outturn, proved to have the effect of seriously diminishing the amount of pulp obtained from any given weight of the grass.

Summing up the results to these experiments, the experts above-mentioned give it as their opinion that the grass is "well suited" for making into millboard, but that it would be useless for white papers from the fact that the admixture of soda above referred to largely diminishes the amount of pulp obtained, and that the material is, under other conditions, exceedingly difficult to bleach. However, what it was desired to ascertain has been definitely confirmed by this report,—viz. that in the mana grass—as probably in many other of your fibrous plants and grasses—Ceylon is possessed of admirable and abundant material for coarse paper making.

You will naturally be desirous to hear what result this report may be expected to lead up to. As yet, and until the success of the shipment of the Stanley-Wrightson tea chests to Ceylon has been confirmed, it is impossible for anything definite to be decided upon. But so far as discussion has at present proceeded, it would seem as if the syndicate manufacturing these chests was desirous of erecting a small factory here with the object of working up mana grass to be imported from Ceylon, before undertaking the establishment of manufactories in that island. Certainly, should that undertaking establish the value of the new substitute, it must ultimately find location in the land of natural produc

tion, but the undertakers will probably do wisely to restrict their first attempts to such as may be conducted under their own immediate supervision. To carry out this scheme the existing syndicate must form an allied company, and as to this we should say there would not be any difficulty experienced. But the whole matter must be held to be in suspense until it is pronounced whether or no the new chests can successfully supersede those of wood.

It caused me surprise to hear this week that the reply to the foregoing question is to be expected rather from the home traders in tea than from your planters. The verdict is dependent upon the opinion expressed on *this* side as to how the teas shipped in the new boxes have arrived in this country. It is not likely this verdict will now be long deferred, for advice of the first 200 chests shipped has already been received. Of course, as I told you, experimental chests have before been received from the Mariawatte estate, the contents of which were delivered in perfect order and with the boxes themselves as sound as when sent out from the home makers to Ceylon. If equally satisfactory results are obtained with the first shipment made on any extensive scale, you may expect to see all the anticipations I have mentioned to you realized before long. The opinion hoped for has been somewhat strongly anticipated by a London firm of tea dealers, which was so pleased with the boxes that it purchased the first 400 obtainable for rebulking and distribution to the retailers throughout the country. This purchase certainly justifies to a large extent the very confident hopes felt by the members of the Syndicate.

The specimens of the grassboard forwarded to you with my last letter had not, you must bear in mind, been subjected to pressure. When that has been applied, as it is to all millboards, by hydraulic power of an extreme character, the soft, pliable paper will become harder than wood itself. A specimen of the material made from waste newspapers was shown to me this week which was so hard that the surface could hardly be scratched. It is expected that the mana grass will yield an equally dense board, and be so superior in this respect to straw, that ⅛ inch in thickness will suffice for tea boxes instead of the ¼ inch strawboard now used. It is estimated that, whereas the latter now costs the syndicate about £6-10-0 per ton, the mana grass board will cost even when made in this country, under £5 per ton, and of course materially less when worked up on the site of its growth. The board made from old newspapers that has been mentioned is sold in London, it has been told me, at £5 per ton.

During the week the pleasure chanced to me of meeting with Mr. Charles Shand after an interval, probably, of some 25 years. It would be absurd to pretend that during that period no observable change was to be noticed in him, but if signs of increased age may be omitted, there remains but little apparent to indicate any effect from his long residence in a tropical climate. Mr. Shand tells me he had not been many days in London before he managed to catch a chill owing to riding outside of an omnibus, but he recovered quickly through the immediate use of quinine. He recognises the danger of his residing here during the winter, and proposes, if he can conclude the business for which he is paying his present visit to us, to return to Ceylon before that season commences here; having also before his view the object of releasing his son after his twelve years of work in Ceylon for a much-needed holiday and run home. I discussed with Mr. Shand the question of pulp from Ceylon fibres, a subject so cognate to the matter above discussed, and he tells me that the result of experiments made by himself was to prove that the grass or plant growing in your island which can be made to yield the largest amount of fibre is the *Yucca gloriosa*, which gives about 12 per cent of finished fibre out of the grossgrown weight. Other plants and grasses, Mr. Shand told me, would not furnish above 2 per cent. Perhaps therefore it would be as well to send some of this *Yucca gloriosa* home for trial at the new board mill when established. It may be mentioned that Mr. and Mrs. Shand, with their son and daughter-in law, are living in the Comeragh Road, West Kensington.

Tea has hitherto not afforded any food products save in the form of an infusion, but it has reached me that a patent has now been taken out for a beverage termed "Sparkling Tea." Indeed the manufacture of this has been commenced, but as yet my knowledge of it is confined to a sight of emptied bottles and the result of my smelling them three days after their contents had been drunk. Even after that interval the scent of tea was quite apparent. The new drink is said to class as one of the many so-called temperance drinks, that is to say that it is quite non-alcoholic, while it is so briskly effervescent that it is said it might delude a reformed toper into the idea that he had relapsed from his bettered principles and gone back to the days of champagne drinking. It appears that the patent has been taken out by Mr. Wrightson of St. Olave's Warehouse, who is also a co-patentee of the new tea chests. Probably opportunity will be afforded me of learning more about this "sparkling tea" before next writing, and of being able to record for your information my own tasting of and verdict upon it. We hear that it can only be produced satisfactorily from teas of a high class, those hitherto used having been of Ceylon growth.—*London Cor.*

CEYLON TEA IN 1889-90:

ANNUAL REPORT OF MESSRS. WM. JAS. & HY. THOMPSON.

We extract the portion of the Annual Report of the above well-known firm of Brokers, referring to Ceylon. They deal with the twelve months ending 31st May 1890 for India and Ceylon, corresponding to the Indian Tea Season closing in Calcutta on 30th April, which ought to be the date adopted by the Colombo Chamber of Commerce. Here is the Report on Ceylon:—

CEYLON.—The rapid progress made by this branch of the Industry is again the feature of the year. Notwithstanding temporary checks and disappointment, caused at one time by drought, at another by excessive rainfall, the estimated increase in Production has practically been realized. It has been accompanied by an almost equal increase in Consumption, to which the stimulus was imparted by the low prices ruling last summer; when quotations rose in the autumn the high standard of quality then reached kept the movement going, which has been steadily maintained ever since.

A noticeable modification in the scale of values has occurred, not in the average result, but in the direction of a narrow range of quotation—which seems to be the expression of a feature which marks the Ceylon Tea of today, viz.: a more uniform character predominating throughout than used to be the case. There is now less tea of specially fine quality than was at first made, and a scarcity of the rich mellow liquoring varieties peculiar to Ceylon. On this and other points, what we have written under the head of Indian is equally applicable; and Ceylon, being a younger industry, can still less afford to risk the reputation

which real merit won for it. So long as that is maintained, there is every reason to think it will keep its position in the Home market; while, as regards its introduction elsewhere, prospects are encouraging in Russia, where price is no object, as well as in America and Australia. Export from London is now at the rate of 1¼ million lb. per annum: and steady progress should follow the persistent efforts being made to attract buyers in other markets.

In their own interests producers should do what they can to lessen the number of separate invoices and breaks, for it is becoming difficult even for the most industrious buyer to examine all the samples offered. While estates are giving a small yield unsorted leaf might be shipped, but not where crops are large. Retailers like to select and blend for themselves: and demand from different parts of the country calls for tea of such different grade and type that it could not be fully met by unassorted leaf, devoid of distinctive character in cup. The great variety of Indian has been of primary aid in extending its use; and this will almost certainly be the case with Ceylon Tea.

The probable effect of the reduced duty on values has been much discussed. Judging from the active demand, coincident with the reduction and the advance in prices, the result has been favourable to the best teas, *i.e.*, to Indian and Ceylon, not to China. This tends to confirm the opinion held by some who are in close touch with consumers, that the public may take advantage of reduced retail prices to buy better tea; which agrees with our observation, often recorded, that tea-drinkers are learning to appreciate the benefit of using good qualities.

TRANSACTIONS IN CEYLON TEA AT AUCTION.
Twelve months ending 31st May,

pkgs.		lb.			per lb.
1890...450,000	equal to	31,500,000	Av. pr.	about	11d
1889...381,500	„	26,500,000	„	„	10½d
1888...227,000	„	13,600,000	„	„	1s 0½d

INDIAN, CEYLON AND JAVA TEAS.

Having quoted above that portion of Messrs. Wm. Jas. & Hy. Thompson's annual tea review which referred to Ceylon tea, we now—see page 93—give the more extended remarks on Indian teas, to which readers of the review of Ceylons were referred. Planters will, no doubt, give due consideration to the advice proffered and the information afforded. Some of the figures appended are interesting. Out of 36,107,000 lb. exported in the season ended 31st May, the vast bulk was China, the proportion of Indian seems to have been about 3 millions and of Ceylon 1¼ million, or 4¼ millions of Indian and Ceylon kinds against nearly 34 millions China. It is, of course, a testimony to the better qualities of the Indian and Ceylon teas that so much should be taken of them for home consumption and so little left for export. But as production increases, so will the quantity available for export *from Britain*. The italics are used to remind our readers that the exports of tea direct from India and Ceylon to markets other than that of Britain are considerably in excess of the figures we have quoted. Altogether this year we suppose about 8 millions Indian teas and fully 4 millions Ceylon will be diverted from British consumption, by being consumed in the countries of production or sent direct to Australia, America and other countries. The exports from Britain for 3 seasons have been:—

1888	...	35,200,000 lb.
1889	...	39,500,000 „
1890	...	36,107,000 „
	Total	110,807,000 „
	Average	36,936,000 „

or close or 37 millions, of which, probably, for the 3 seasons, 34 millions have been China, against an average of 3 millions Indian and Ceylon. The figures for home consumption for the 3 seasons are *not*, as Messrs. Thompson say, altogether satisfactory, even if we take into account Mr. Goschen's statement that 7 lb. of Indian or Ceylon tea leaf are equal to 10 lb. of China. The progress in the 3 seasons has been as follows:—

1888	...	183,000,000 lb.
1889	...	185,250,000 „
1890	...	187,940,000 „

The increase in the 3 seasons has been only 4,940,000 lb., or not quite 5 millions of pounds. While the *home consumption* of Indian has increased steadily and that of Ceylon rapidly (from 12½ millions to about 32* in the 3 seasons), and while Java shows a slight decrease, China has gone down as rapidly as Ceylon has gone up, the decrease on the tea which had once the monopoly of the world having been from say 85 millions (home consumption) to 55, a decrease of 30 millions, against an increase in its ousters of

Indian	...	16,000,000 lb.
Ceylon	...	19,000,000 „
Total	...	35,000,000 lb.

—the equivalent of 50 millions of China, on the principle enunciated by Mr. Goschen. With the reduction of duty, let us hope that our British friends will henceforward drink as much of the stronger infusion as they formerly did of the weaker, and *more*; the abominable custom of putting the teapot on the "hob" being abolished, so that tannin may be imbibed in moderate and useful quantity and not at a rate which is injurious.

The figures for the course of prices in the three seasons are interesting. As deduced by the eminent brokers the figures for Indian teas show a commencement with 1s; a rise to 1s 0$\frac{1}{20}$d; and finally a fall to 10⅞d per lb. Ceylon began with a higher figure 1s ½d, but instead of rising fell next season to 10½d, recovering to 11d, which is 4·7ths of a penny higher than the average of Indian for last season. Ceylon is likely for several years to go on gaining on India in total produce; but no matter what aggregations may be made in the formation of companies in our island, it is difficult to suppose that any one "concern" in Ceylon will ever approach the old Assam Company with 7,520 acres of land and a production equal to 2,674,000 of tea. The Joktai follows with 4,922 acres and 2,309,000 lb., while the Assam Frontier Company, although its acreage is only 3,300, shows an outturn of 2,380,000 lb. Besides these 3 above 2 millions, there are 3 more above 1 million, and quite a considerable number with between 500,000 and close up to 1 million. The average yield per acre for the Indian estates is 408 lb., against, for our much younger Ceylon estates, an average of between 200 and 300 lb. If, as in the case of India, "mature" tea only were counted, our average is quite equal to that of India.

In 1889, out of 34,346,000 lb. of tea exported from Ceylon, we find that 1,689,000 were diverted from Britain. This quantity added to 1,250,000 exported from Britain makes up a total of 2,939,000 lb. Local consumption will certainly more than make up the round 3 millions, perhaps 3½ millions? Our chief export was to Australia, 1,162,783 lb., against only 87,664 in 1885. Next to Australia we have, strangely enough, British possessions in India 383,544 lb. against only 5,000 in 1885. The United States come in a very poor

* Approximate figures for exports deducted from total deliveries.

third with 24,000 lb. This is an increase on 366 in 1885, but a great fall from 42,000 in 1888. But we are only feeling this market. To Mauritius we send nearly as much as to the United States, and not far behind is France, while Germany, with 33,000 lb. to the two ports of Hamburg and Bremen, is even in advance of the United States. The Straits Settlements are down for over 7,000 lb., while over 8,000 for Suez are not all for consumption in Egypt. Over 5,000 lb. actually went to Hongkong, to compete with China tea. Russia took 3,700 and Austria 5,300, Italy contenting herself with 2,281. A quantity equal to 2,884 went to Bushire, and 1,315 to Malta, while besides the quantity already credited to Hongkong 1,105 are down for "China"! Japan also took 450 lb. Who could have predicted such a reversal of trade, even ten years ago! In moderate quantities, at present, our teas find their way to every part of the world, and we may hope that thus a taste for what is pure and good in the shape of beverage may be created or extended.

Java teas have been hitherto of but little account for quantity or quality, but last sales show a wonderful spring upwards in prices. There can be little doubt that the improvement is largely due to the increase in the production of Assam kinds, which, grown in Java at low elevations, come rapidly into bearing. Java is likely to take a more important position than it now occupies.

INDIAN TEA: ANNUAL REVIEW.

MINCING LANE, June 1890.

The record of the season, completed by the figures for the year ending 31st May, is a satisfactory one, from whatever point of view it is regarded.

Production has increased, but not at the cost of quality, for the crop as a whole has been rather above the average in merit—if we except the want of flavour which characterized a portion of it—and to this we attribute the fact that *a great increase in consumption has been attained, without the incentive of lowered prices*, notwithstanding the growing competition of Ceylon.

The question of quality is, indeed, the most important matter which can engage the attention of those concerned in production; for while there is evidence that Indian tea has taken a hold upon popular taste, so firm that it will not easily be shaken, there would be risk of reaction if quality were lowered in pursuance of a policy having for its principal aim a heavy yield. That some, attracted by the prices lately paid for the lowest grades, will adopt such a policy must be expected—and there are no doubt, many estates so situated that a large crop can be secured with more certainty than a fine one—but for those who have proved their capacity to make good tea, without unduly limiting the out-turn, it would be a hazardous experiment, and one affecting not themselves only, but the general interests of the industry. Reputation counts for much—and a crop is apt to be reputed good or bad, as a whole, from the character of those leading brands with which every considerable trader in the kingdom is familiar. This especially applies to Assam and Darjeeling teas, because the difference between their fine and common qualities is marked by a wider range of quotation than in tea produced elsewhere; but the principle is of general application, and operates with more and more advantage every year, as supplies increase, to those who have succeeded in establishing a high character for their brand. To those who have hitherto been less successful than others in this respect, it should be an encouragement to know that the season has afforded instances of teas rising to a high place in the market's estimation solely on their merits.

The inferior character of the China crop has contributed to the progress of the Indian trade at home—indeed, the point has been reached at which the buyers scarcely account the low current price of China congou a matter affecting the value of Indian—but, on the other hand, the rapid growth of supplies from Ceylon, and their popularity operate in the other direction. Good medium Indians,—especially pekoss and braken pekocs—have unquestionably suffered from this competition, but not the finest qualities, which are too distinct in character to be displaced, whereas good Ceylon teas can be substituted in a bleod for Indian of average quality whenever price ersinoff-ucemodnt,

The quality of the coming China crop, and the general character of Ceylon teas, remain the factors of uncertainty; but we have, so far, no indication that the conditions which have shaped the course of the market in the past are likely to be largely modified.

Matters of detail are so fully grasped by those who have the management in India and at home, that it is only needful refer to them briefly. The necessity, and the advantage, of putting large breaks upon the market have led to a gradual abandonment of factory bulking. From many points of view this is a retrograde movement; but on the whole we do not think it prejudices value. Careful observation of results in the case of large concerns which have resumed London bulking, shows that tea is brought to market in the highest condition, provided that no considerable period intervenes between bulking and sale. This of course implies that tea deteriorates after bulking here—and it may be asked how does that affect the buyers' estimate of value. As a matter of fact the "keeping quality" of what they buy is not studied by the trade so much as it was when they carried heavy stocks: the opposite policy now prevails, and is fostered—by the unbroken inflow of supplies. This necessarily tells against sellers in the months when pressure is heaviest—or when the crop is a poor one, as in 1888-9—but it has made the general position of the article sounder, and imparts an elasticity to the market when supplies are curtailed, unknown in former years. Prolonged periods of depression such as were experienced in times past, are now infrequent, and the reason is that the distributors, holding small stocks are constantly buying.

A subsidiary question, but one of the deepest concern to producers, is that of finding fresh outlets. Towards the 190 million lb. probably required for home use during the coming year, India and Ceylon together will contribute fully 150 millions; and the time is approaching when the combined crops may equal the total Home Consumption. As it is not likely that China tea will be entirely displaced, the contingency of a supply eventually heavier than can be taken at home must be faced. Taking as a basis the figures for the five months of this year recorded by the Board of Trade, the annual export of Indian tea is only about three million lb. Russia, the largest European outlet, will probably remain closed to us so long as it can get the China congou which popular taste demands. There remain Australia, Canada, and the United States. Good progress is being made in the former market from Calcutta: and systematic work, originating in London, is being done in the States and Canada, but much more would be effected if producers as a body applied themselves to it: meanwhile, we must hope that the enterprise of those who are advertizing and pushing the sale there may bear fruit. Unfortunately the American market does not yet see the merit in our finest tea, and demand is so limited by price that business is checked by any advance here; it will therefore be necessary to come into closer contact with consumers, in order to cultivate the taste for our tea.

The following figures for the past season, kindly supplied to us by proprietors, cover nearly 73,000 acres yielding 29,800,000 lb., an average of 408 lb. per acre, realising an average sale price of 11⅜d per lb.

Previous tables showed the following results:—

	Acreage.	Quantity. lb.	Per Acre.	Price per lb.
1888-9......	66,000	27,200,000	412	0 10 ·37
1887-8....	60,000	22,664,000	377	1 0 1·20
1886-7....	56,300	21,500,000	382	1 0

W. J. & H. THOMPSON Brokers.

MINERALS AND GEMS.

The total value of minerals and gems produced in the Madras Presidency during the year 1889, was R8,14,528. Gold is not returned by the Nilgiris, the total being 2,186 oz., valued at R96,944. Iron was chiefly obtained in the Bellary and Malabar Districts. The total for the whole Presidency was about 119 tons, valued at R11,614. Of quarry stones, granite and limestone are the chief sources of revenue, the former contributing 402,396 tons, valued at R2,59,656 and the latter 1,421,752 tons, valued at R1,83,605. Of other items laterite is returned at 178,592 tons, valued at R86,094; sandstone 62,000 tons, valued at R22,255; trap 228,412 tons, valued at R77,002; 315 tons of clay, valued at R495; 58 tons of slate in the Kistna District, priced at R140; and other quarry stones 63,703 tons, valued at R67,377,729 cwt. of corundum or balpum were quarried in the Anantapur district,

the price being R154. Of ochres, there were 1,026 cwt. valued at R336; six cwt of plumbago in Vizagapatam, valued at R15; and 1,954 cwts. of soapstone at R8,840. The largest amounts are contributed by the districts of Nilgiris (R1,51,870), Salem (R1,44,198) and Kistna (R1,09,482). In Kistna and Salem large quantities of granite and limestone are quarried, while gold is the chief item in the Nilgiris. Trap also forms an inconsiderable item of revenue in Salem and the Nilgiris.—*Madras Times.*

DURABILITY OF FENCE-POSTS.

To the Editor of "Garden and Forest."

Sir,—I am told, though not authoritively, that a fence-post will last much longer if put in the ground upside down. Can you let me have either a confirmation or refutation of this? B.

Mount Airy, Philadelphia.

[Some years ago Dr. W. J. Beal, of the Michigan Agricultural College, selected sticks of thirteen different kinds of timber. Each stick was cut in two in the middle, and each of these was split, making four sticks from each one. One set was placed in sandy land, and the other in clay land; in each place putting near each other a stick "top end up," and its mate "bottom end up." In some cases those with top down lasted best; in some the reverse was true, while in others there was no perceptible difference. The conclusion reached was that, so far as durability goes, it made no difference which end of the post was set in the ground.—ED.]

THE WONDERFUL SLAG WOOL.

Slag wool is formed by causing a jet of steam to impinge upon the stream of molten slag as it issues from the furnace. This has the effect of dispersing or breaking up the slag into countless small bead-like particles, each of which, as it flies away, carries behind it a delicate thread of finely-drawn or "spun" slag. In order to collect the slag filaments thus created, and to separate the fibers from the bead or heavier portion of slag, the steam jet is arranged at the mouth of an open cylinder of sheet-iron, in which a strong air current is induced by means of additional jets of steam. The tube or shaft is furnished with a shield or striking plate which detains the heavier particles, the lighter slag-wool being carried by the draught upward and onward into a large chamber like a gigantic meat safe, having its walls formed of wire netting with about sixteen meshes to the square inch. Here the steam condenses and escapes, and the slag wool, which has the appearance of flakes of snow, is deposited on the floor and round the sides; the lightest portions being carried to the greater distances.

The filaments of slag formed this way, though of considerable length, are of such delicacy and fineness that they are broken up into numerous fragments and felted together into a substance much resembling cotton wool. This mineral wool is extremely light, and absolutely fireproof; it is a marvellous non-conductor of heat and of sound, and it is so porous that it will absorb large quantities of water and retain the same for a considerable time.

It has been found extremely valuable as a covering for boilers, water pipes, and such like—owing to its relatively low conducting powers—and for fire curtains for theaters, its lightness and resistance of fire and sound rendering it an excellent substance for such a purpose. It is, moreover, an antiseptic, and this property, along with its extreme porosity, renders it applicable for medical purposes.—*Newcastle (Eng.) Chronicle.*

MR. THOMAS CHRISTY has again come back into our midst from his Eastern travels. He has collected a wonderful variety of new and interesting drugs during his visits of exploration to the Constantinople bazaars, and may by-and-bye favour the drug trade with some notes concerning these.—*Chemist and Druggist,* June 19th.

COFFEE PLANTING IN TAVOY, BURMA: PROSPECTING IN THE HOLIDAYS:

BY A SEARCHER FOR NEW PASTURES.

On arrival at Tavoy my first step was to possess myself of such information as papers in the Deputy Commissioner's office afforded, both with repect to lands where planting enterprise had already been attempted and available lands in the district in general. The situation of the former I found to be at the extreme southern end of the district, and the history of their election, demarcation, attempted cultivation, and abandonment is instructive. It would appear, then, that about the year 1882 Mr. Smeaton, Director of Agriculture of British Burma, happened to visit Johore, and there made the acquaintance of a gentleman from Ceylon who had been instrumental in opening out various coffee estates on lands leased from the Raja of Johore. Mr. Watson was invited to look at the lands in Tavoy, and proceeded thither. He was taken to a locality known as the Natyaydoung Range, which he pronounced as suitable for coffee; and, with the promise that he would come again, left after a brief stay of only a few days. Upon this encouragement a notification was issued by the Government inviting settlers, and orders were issued for the demarcation of a number of uniformly sized allotments, the provision of a couple of rest-houses, and the construction of a roadway leading from the town of Tavoy. There is evidence that the authorities were zealous in the matter. A base line five miles in length nearly north and south was cut, and a rectangular area marked off for plantations. The total area of this rectangular tract was thus 12 square miles, comprising twelve concession blocks of one square mile each, and in due course a topographical survey was furnished. At this time the ruin of coffee had driven many promising young men out of Ceylon, and two of these, Messrs. Dixon and Theobald, were endeavouring to obtain contracts for earthwork on the railway to Tongoo which was then being made. They came under the attention of the Chief Commissioner, and at his instance were induced to embark for Tavoy. They had little or no means, but they brought the promise with them of being assisted in all that it was possible for the Government to do.

On their way down they seemingly fell in with a Polish skipper, a Mr. Schwalky, possessed of some money, and who had had experience of tobacco growing in Sumatra. The two established themselves in adjoining blocks for a brief while only, and no vestige now remains of their work except a clump of caoutchouc trees planted by Schwalky, which have attained a good height and look remarkably fine. Incidentally it may be mentioned that the Pole came by his death in Sumatra shortly after leaving Tavoy. One of the visitors who came, and has stayed ever since, a Mr. James Watson from Ceylon, refused to take up any of the demarcated blocks, and was allowed to select a plot close to the town of Tavoy.

Mr. Watson has been 17 years in coffee in Ceylon, and has been endeavouring for now five years in Tavoy to turn his experience to profit. His difficulties have been many, arising from an absolute want of means to extend his cultivation. In his home plantation he has successfully reared many species of products, which evidence what can be grown in the district at a profit if undertaken on a large scale; and it is to Mr. Watson's credit that he always manages to keep on good terms with the natives, and is able to command ample labour, had he the means to employ it. Government have encouraged Mr. Watson by the payment of a handsome bonus for coffee grown by him, and have otherwise recognized his claims to consideration by the grant of a tract of 400 acres rent free for a period of twenty years. Mr. Watson has all this land upon his hands just at present, not having the means to work it, and Government have declined to help him with any money advance. This completes the history of planting enterprise in Tavoy up to date.

A great deal of money has been spent by Government, and some by private individuals upon the advice of the gentleman from Johore. Naturally, I went in this direction, first of all, to see for myself. I had the good fortune to be accompanied by the Deputy Commissioner, who was attended by an Extra Assistant Commissioner, a Burmese gentleman of many years' residence in the district, and who had accompanied Mr. Watson to Natyaydoung. We traversed the tract which had been aligned in 1882, which may be described. There is a good driving road from Tavoy to Thatyatchoung, 18 miles, which is the anchorage of the mail steamers. This was our first stage, halting for the night in a Public Works Department resthouse. The second day's journey was a bridle path through forest 11 miles to Pywehoogyee, 28 miles on to Sousin, on the Mindat river. We passed the night in the house of a villager. The next day commenced with the business of getting ferried over the Mindat river, which in this part is a broad stream. On the opposite bank the path runs over raised earth through paddy fields, and winds its way through the village of Yayngai across one or two nullahs, one in particular large and deep, the haunt of alligators, to Khedive. From hence the most direct way would be onwards along the course of the old military road known as the Alompra Road, but the path here strikes to the coast.

At Boktaung, literally on the sands, we breakfasted at midday. The track from here turns inland over slightly rising ground, and is entirely obliterated by numerous water channels impassable in the rains, and in which event at this, the most favourable season of the year, the water was sometimes up to the saddle. The last few miles of this stage run over open ground, offering poor pasturage from the inferior seed-bearing grass, and extending by a gradual slope to the base of the Natyaydoung range. The prospect is very picturesque. There is a perennial stream of good water dividing the lands which lie quite at the base of the range from the hither side, Kayinchoung, where we encamped for the night. This made three days' journey from Tavoy. On the following morning we visited the site of Mr. Schwaiky's and the other plantations, and made the ascent of the hill side. The soil at the base I found to consist of clay and sand, each occasionally predominating, and at small depth the soil becomes gritty or gravelly. This arises from numerous concretions similar to kunkur some of a brick red, some of a black colour, forming strata running in wavy lines through the soil. It was on land of this character that Mr. Schwalky attempted to raise tobacco, and Messrs. Dixon and Theobald coffee. The ascent of the hill and the existence of a large tank of water at the highest point, evidenced that the character of the rock was igneous. The forest growth was so dense that with a number of coolies cutting the way ahead we were unable to ascend beyond 1,600 feet (registered by the aneroid) without being belated or having to spend the night on the mountain side. But we obtained a sufficient view of the prospect to make it incomprehensible to my judgment how it should have been fixed upon as suitable for planters There is no hill side, but a series of stony ridges as it were buttressing the hill with steep declinations in narrow gorges between the ridges. The blocks have a general westerly aspect, exposing them to the force of the S. W. monsoon and a saline breeze all the year round. Again, if the soil were of the finest, the absence of properly maintained communication places the locality quite out of touch with the town of Tavoy, 60 miles distant, where the settler must occasionally proceed for the transaction of business and for supplies. Supposing a party of coolies were sent down from Matyaydoung—the journey would take three days, and if they had to return with loads, not less than four or five days to get back. For four or five months in the year under existing circumstances it would be impossible for coolies to get down without many risks from the flooded state of the streams. Ten out of 20 coolies would never return, some would assuredly bolt, and others would be stricken down with fever. The coolie difficulty in a wild region where the coolies were alien to the soil, and where they could not get their currystuffs and accustomed food, and where the climate is tropical, would occasion, in respect of labour imported from Behar, a certain failure. The latitude is exactly that of Jamaica, capable of producing coffee and various remunerative products, such as indigo, which I found to be growing wild on the land skirting the base of Matyaydoung. There is no doubt that it is indigenous, and could be cultivated with profit. But the prospecting of land requires special knowledge of the character of the soil and of the most suitable crop to be planted thereon; and in this connection the experienced planter will not so much regard the surface of the land in growing coffee and other fruit trees as that the subsoil must be friable and drainable. Clay land and rocky land is always water-logged, and especially detrimental to the cultivation of coffee and cinchona.

I have stated that the Burmese Extra Assistant Commissioner who piloted Mr. Watson accompanied the Deputy Commissioner on the occasion of my visit to Natyaydoung; and from this gentleman, who has resided in the district for more than 30 years, I was able to gather a mass of valuable information with regard to culturable lands elsewhere in the district. From what he told me I am inclined to the supposition that some confusion in two very similar names led to Mr. Watson visiting Natyaydoung in place of Nawadoung. At any rate, Moung Pet, the Burmese gentleman alluded to, was very pressing that I should visit Nawadoung, which lies in a valley at the head of the Mindat stream on the eastern side of the Oxhump or Nawalabo range. There are said to be miles of rich undulating land, the produce of which might be carried away by the water carriage afforded by the Mindat river. The journey to this spot, however, involved three days by boat and canoe, and I was anxious to prospect the more central part of the district and the land at the head waters of the Tavoy river in a northerly direction. But still, in view of the Nawadoung valley affording culturable lands accessible by the Mindat river, we proceeded to the mouth of that river, where it empties itself to the Tavoy river, as a likely site for the disembarkation of coolies and stores, and for the establishment of a depot. The channel here is stated to be six fathoms, and navigable for some 14 miles. We encamped on the river bank for the night, and returned to Tavoy by water in time for Christmas. It is noteworthy that there is an almost entire absence of roads, and the interior portions of this district, which covers an area of 7,150 square miles, have apparently rarely if ever been visited by Europeans. No Deput Commissioner in recent times has been here sufficiently long to go much into the district, which is impenetrable during the rains, and malarious on their cessation. In these circumstances it cannot be too distinctly made known to the intending visitor desirous of prospecting for land, that he should provide himself with a complete camp equipment of furniture and cooking utensils, a cook, pony, and stores, and a well filled bag of rupees for the hire of elephants and coolies.

I have pointed out that the demarcation of a prescribed area for the location of intending settlers was a blunder from the unsuitableness of the site fixed upon, and a double barrelled blunder in the sense that, while the varying soil of the district invites every description of cultivation congenial to the latitude and altitude, coffee cultivation would seem to have been alone contemplated. The moral of it is that, in a district the area of which is 7,150 square miles, the responsibility of selecting land should rest with the settler. The district officer is not in a position to help him, at any rate much. Frequent changes of the Deputy Commissioner have not allowed of the officer in charge gaining that knowledge of the district only to be acquired by personal visitation. It is an absolute fact that the greater part of the Tavoy district is *terra incognita*, and portions of it would seem never to have been visited by any European within the memory of local tradition. The absence of roads, the dense forest growths, and the consequent unhealthiness of the interior certainly do not invite the district officer to penetrate the country, and the obligation of his executive duties

as Chief Magistrate, unassisted by any competen- European subordinate, chains him at headquarters. The district officer, furthermore, however ubiquitons cannot be accepted as an authority on the suitableness of lands for planting purposes; and the Government can do no more than mark down the locality of waste lands and leave it to the intending settler to prospect for himself as to their suitability for his purposes. At the same time the difficulties in the way of an individual planter prospecting the district are almost insuperable, unless he is prepared to rough it very considerably and to pay heavily for every step he takes.

Only the magic influence of authority is able to command elephants and coolies and boats without vexatious delay and overcharge. All these difficulties, were smoothed to me, and there was, so to speak, only the bill to pay; but what money may not purchase was the wealth of information elicited on the questioning of villagers and headmen summoned to the Deputy Commissioner's presence in the evenings of our halts. Here I learnt many interesting particulars in regard to the nature and position of lands which my time did not allow me to visit. I have alluded to the waste of money naturally incurrred by the mistaken demarcation of allotments for planters on the Natyaydonng range, and the construction of a road thereto from the town of Tavoy, 60 miles distant, all arising from an insufficient knowledge of the district and of the lands most suitable for varieties of cultivation, points which planters alone are capable of determining; and I would throw ont the suggestion, althongh Government has little enough money to spare for snch a purpose, yet that for just once in a way the Government might make up a party of three or four practical planters and send them all round the district on a cold weather tour with the Depnty Commissioner. The outcome of this might confidently be regarded as something practical. To my own observation I have seen thousands of acres of splendid lands lying in valleys and on the slopes of hills, forest grown, and inaccessible for want of road communication with a main track such as a systematic survey by planters would indicate to be both natural and convenient. The longest open ronte in the district is along the alignment of the telegraph line running from the town of Tavoy, 40 miles, to Muttra in the centre of the district and along the valley of the Tenasserim river for 40 miles more, until it strikes through a pass in the hills leading into Siam. This is commonly known as the old trade route, but as a matter of fact it has never been a trade route, old or new, and there never has been or is there any trade passing by this or any other way into or from Siam. As I am informed, there was of yore a track through the forest directly over the hills in the wondrous straight line of travel marked out by natives for themselves in primeval tracts where the D. P. W. is yet uncreated, which struck the Tavoy river some few miles above where it empties itself into the sea. This route presented many dangers by flood and field, from wild beasts, and hardly less dangerous now if the traveller escaped drowning from broad rivers and swollen streams. It was the known highway, but was rarely travelled on, and came to be altogether abandoned upon the construction of the road along the telegraph alignment. This road, which has cost a great deal in construction, and which involves a heavy maintenance charge to keep it in repair, serves no trade purposes. There are not, perhaps, 100 travellers passing along it in the year. It is purely for the quick repair of the international telegraph line communicating with Bankok. The utility of this road for any trade purpose is problematical, seeing that Tavoy, which is capable of being made a port as good as Moulmein, at present offers no outlet or ingress for goods or produce, there being a wretched steam service supported by the mail subsidy. It is capable of tapping the district in various parts along the course of produce which might be grown; but for more than half its length, after crossing the water at Mitha at the confluence of the three rivers which unite here, it pursues its way along the bank of the Tenasserim river, overhung by a steep hilside.

The Tenasserim river runs due south from Mitha, where it takes a bend and runs parallel to it under the name of the Bainchown, which has its source in the hills at the Natyaygoung end of the district. It is up the valley of the Bainchown that the principal road would have to be made. Here on both banks there are fertile lands sloping to the water and breasting the hills. It is here that the familiar expression of thousands of acres of rich lands lying uncultivated may be rightly applied. The valley is broad, open, and wide, and yet is shut in until at its southern extremity the mountain track already mentioned as the ancient highway to Siam shall have been adapted to wheeled traffic. But it is not here alone that thousands of acres offer, but all along the valley of the Kamounthway which is the name of the third river uniting at Mitha. The Kamounthway runs due north, finding its sonrce on the hills which are as a wall between Tavoy and the adjoining district of Amherst, and from which the River Tavoy also derives its origin. At the head waters of the Tavoy river the Government has its principal Forest-reserve which is rather of the nature of a prospective reserve, not yet supplying timber in any quantity. Indeed, the two forest reserves, one in the north and the other in the south, appear to me to have been marked out in localities from which the timber can only be got out at greater cost to Government than it can be worth while to incnr, viewing the proceeding in the light of an ordinary profit and loss transaction. Obstructions in the river necessitate blasting on a large scale at several points; and the art of timber felling by the employment of machinery has yet to supersede the rude methods practised by the Forest Department.

All down the Tavoy river there are lands suitable for the planter, that is to say, at various points, and standing back from the river almost until the town of Tavoy is reached, where the country is lowlying and alluvial, and for the greater part only capable of paddy cultivation. I have been asked what Tavoy is capable of growing besides paddy that would be profitable to the settler. The enumeraticn of crops and economic products is emphatically endless. All that the fertility of Ceylon and the Straits Settlements may produce is concentrated in Tavoy, with the advantage of latitude, and with the peculiarity that here will be found in more luxuriant growth, the flora of considerable altitudes on the Coromandel or opposite coast, and elsewhere in India. The *Quercus fenestra*, a species of oak common to the mountains in the vicinity of Sylhet, grows indigenous in Tavoy, not fifty feet above the level of the sea. The gamboge *garcinia pictoria*, which grows on the highest parts of the Wynaad, is fonnd at the foot of the hills in Tavoy, which border on tide water. The *Ardesia humilis* is a common shrub at Tavoy, growing down to the plains, but its habitat on the other coast is the eastern slopes of the Neilgherries in sub Alpine jungle. Indigo is seen growing in wild profusion all the year round. The flora reads a lesson as to the climate of the country which cannot be mistaken, notwithstanding the unfortunate conditions of heavy rainfall. There is not the least doubt that, with temperance, and avoiding unnecessary exposure, Europeans may live in Tavoy longer than in Assam, if, be it noted, an extensive clearing of forest, and drainage so as to divert flood waters, were systematically undertaken. This rich and great tract of country has never been opened out by private enterprise in the whole course of the 60 years that it has continued under British rule, and its head quarters or principal town comprises an inconsiderable village. The town of Tavoy stands in alluvial ground, and is hidden in the distance by tall palms and glossy-green jacks, and yellow-flowered cassias and twenty other flowering trees which overshadow its humble dwellings. From a neighbouring eminence the prospect is of undescribable beauty, a plain of encircling paddy fields intersected on the south by a silver stream fringed with the dark foliage of wild fig trees and the thick struggling bnshes of a species of trihiscus covered with large yellow and red flowers. On the east "hills peep over hills" like the seats of a vast amphitheatre, bounded by Ox's Hump, rising in

a most picturesque ontline four thousand feet above the plains. In the distance is seen a foaming cascade making a fearful leap from a gorge halfway up the highest mountains. Green forests are diversified with rugged rocks, while here and there a whitened pagoda lifts its conical head above the summit of an isolated hill, or the smoke of a solitary hamlet is seen curling upwards on the still air. It is beautiful, when seen on the coast, with the picturesque beauty of Scottish hills; but it is still more beautiful when seen around its mountain streams. The traveller's path often made up the middle of one of these streams, and every turn reveals something new and pleasing to the eye:

" Ferns, flowers, and grasses creep,
Fantastically tangled; The green paths
Are clothed with early blossoms; through the grass
The quick eyed lizard rustles, and the bills
Of summer birds sing welcome as ye pass;
Flowers fresh in hue, and many in their class,
Implore the pausing steps, and with their dyes,
Dance in the soft breeze in a fairy mass;
At every door the odorous jasmines rise,
Kissed by the breath of heaven, seem fragrant for the skies.

—*Englishman's Overland Mail.*

EAST AND WEST INDIAN SUGAR MAKING.

There is much scope for the establishment of large Sugar plantations in this country in places where the soil is good, labour cheap, and an ample and certain supply of water available. Land in Northern India, in the vicinity of the canals, would, I should say, be admirably adapted for this purpose. There the soil is good, with a perennial supply of water for irrigation, and a redundant population.

The soil and climate of certain portions of the Central Provinces where there is, or could be, considerable irrigation from tanks, as in the Sambalpur and Bhandara districts, and in some of the Feudatory States of Chattisgarh, would also be suitable. The former would probably be more suitable than the latter, for while the Canes might occasionally suffer from frost in Northern India, in the Central Provinces the supply of tank water might fail in years of insufficient rainfall.

For the formation of a plantation after the model of those in the Mauritius and in the West Indies, the action of Government will, at any rate, in the first instance be necessary.

The small cultivators of India have neither the means nor the inclination for undertaking such a task. It would never occur to a large landholder in this country to make money by growing Sugar on a large scale by new and improved methods, and by the expenditure of a considerable capital. By the trading classes the whole thing would be regarded as entirely beyond their sphere of action. The only persons who would perhaps have the requisite enterprise and means to undertake such an industry on a large scale are European planters, who can command the necessary land and capital, but they have already profitable crops, like indigo, which do not involve the same expenditure, and which can be carried on without extensive irrigation. It would be impossible for a West Indian planter, supposing he could command the necessary capital, and was prepared to make the venture, to provide himself with the requisite land. There are, it is true, extensive waste lands in this country, but they are quite unsuited for such an undertaking. They are either far removed from inhabited tracts, or are situated in unhealthy countries, where no European could live, and even if accessible, they are rocky and barren. The natives of this country are only too ready to appropriate all land, which is at the same time fit for cultivation and fairly accessible, and they have already absorbed all such land as is available or worth appropriating. No native will willingly part with the land he cultivates, and if the whole area of an ordinary village could be purchased, a large portion of it would be in the cultivation of ryots, with occupancy and other beneficial interests in their fields, who could not, in the ordinary course of law, be rejected to make room for Sugar cultivators. Under these circumstances, a Sugar-planter, who, whether he came from Barbados or the Mauritius, would be a stranger in this country, would find it difficult, if not impossible, to make satisfactory arrangements for the establishment of a plantation.

It will be necessary, therefore, for Government to take the initiative in this matter, and by means of the Land Acquisition Act, or other appropriate procedure, to acquire land sufficient for the establishment of a Sugar plantation of 500 or 600 acres. This might be offered rent-free or on easy terms to a practical planter under certain conditions for a term of years, and he might also be given a subvention to aid him in providing the necessary machinery for the manufacture of Sugar.

There must be many enterprising planters in the Mauritius accustomed to Indian coolies who would be glad to accept an offer of this kind. By making success dependent on the efforts of the person chiefly interested in the project, there would be a guarantee that everything would be done to make the scheme a success. But in the event of no practical Sugar-planter being willing to undertake the responsibility of a Sugar plantation on the above terms, it would be well for Government to establish a few model plantations of its own in different parts of India. I understand that some years ago the services of a Sugar-planter were obtained from the West Indies for the diara lands of the Khedive, and that a vast improvement followed the introduction in that country of the West Indian method of growing and manufacturing Sugar. With a plentiful supply of water, such as would be afforded by our canals and large tanks, a good soil and cheap labour, no great difficulties would be encountered in the establishment of a Sugar plantation. If the scheme were once shown to be successful, it is probable that many persons who can command large areas for Sugar Cane cultivation and the necessary capital would adopt it. The greatest difficulty to be encountered would be the securing of an adequate supply of manure. Much of the cowdung of this country is used for fuel, and consequently, good farmyard manure in large quantities is not readily obtainable. But if Sugar cultivation by the West Indian method were shown to be profitable, mineral and artificial manures would be available in India as they are in Barbados and in the Mauritius.

The value of such a plantation would not be confined to improving the production of Sugar. It has often occurred to me that in establishing model farms and placing at their head men trained in England and having a practical knowledge of the agricultural methods only of countries with a temperate climate, that we have somewhat overlooked the fact that the conditions of agriculture in the greater portion of India resemble those of the West Indies or the Southern States of America much more closely than they do those of Europe, and that it is in these former countries that those Indian crops which are most susceptible of improvement, such as rice, cotton, tobacco, Indian-corn, Sugar, tropical roots, vegetables, and fodder crops, are cultivated with the greatest success.

The West Indies, like Mauritius, import the greater portion of their food, but a good deal of Indian-corn and vegetables are also grown in these Islands. A plantation is generally divided into two portions: one is under Cane and the other is under preparation for Cane, and is in the interval used for growing short crops, sweet potatoes, yams, Indian and guinea-corn (juari)—the two latter, with guinea-grass, supplying the necessary fodder for the farm cattle. All of the above crops are capable of great improvement and extension in India. While in this country a few yams are to be found in pan baris, the plant is reared in the West Indies in large open fields. The difference between the sweet potato of India and that of the West Indies is striking. The former is generally an elongated tuber, five inches long and three inches in diameter, and is grown on a flat surface. In the West Indies it is ordinarily an ellipsoid, with axes of ten and seven inches, and grown in rows on banks and

not on level ground. There are other striking differences in the systems pursued in rearing other crops in the West and in the East Indies. The establishment of a plantation on the West Indian model in this country could not, I think, fail to improve the cultivation of all tropical products, and to instruct the people in methods of which they have no idea at present. Some of the return coolies from the West Indies and the Mauritius might also be induced to take service in such plantations, and by instructing their countrymen would be of use to the manager in starting the work.

I might usefully recapitulate the above remarks as follows:—The improvement of Sugar production in India is not possible under existing conditions of scattered cultivation by numerous small cultivators, and in view of the fact that it is nowhere a staple but merely a subsidiary crop. I have further endeavoured to show—

(1) That cultivation on a large scale is essential, if the requisite supervision in growing the Cane and the necessary machinery for manufacturing Sugar are to be provided.

(2) That such a change cannot be brought about unless an adequate area of irrigable land in a healthy and well-populated country with cheap labour is first secured.

(3) That private effort and enterprise are probably unequal to the task of securing the conditions necessary for successfully starting the work.

(4) That it will therefore be expedient, in the first instance at all events, for Government to take the initiative, and to establish a model Sugar plantation.

(5) That the best method of working such a plantation would be to interest the manager in the success of the scheme by leaving the profits to him, Government assisting by finding the land and giving it rent-free or at a low rent, on certain conditions; and, if necessary by a subvention, to aid in the constructing of the necessary buildings, and in supplying the machinery needed.

(6) That in the event of no properly qualified person being willing to undertake the establishment of a Sugar plantation on the above terms, Government should itself arrange for the working of the scheme by a paid agency.

(7) That it would be absolutely essential for the success of any scheme of this kind, that the manager should be a successful and practical Sugar-planter, preferably from the West Indies or the Mauritius, and accustomed to deal with the Indian coolie.

(8) That the establishment of such a model plantation would not only prove the superiority of the West Indian over the Indian system of Sugar production, but would bring to the notice of Indian agriculturists the advantages of other modes of cultivatin, many tropical crops, which, though of great value, have hitherto been much neglected in this country. —*Produce Markets' Review.*

TOBACCO:—LONDON BORNEO CO. (LTD).

The first yearly general meeting of the shareholders of the above company was held at Cannon-street Hotel, on the 23rd Dec. 1889. The Hon. Charles Hedley Strutt, chairman of the company, presided. There were also present Mr. Thos. Palmer Chapman, Mr. Wm. M. Crocker, Mr. Henry Devitt, and Mr. Wm. Henry Read.

The Secretary having read the notice convening the meeting, the Chairman said:—Gentlemen, I hope that none of the shareholders have been disappointed or discouraged by the nature of the report which the directors felt it their duty to place before them at this meeting. We did hope that we should not have experienced the difficulties and troubles which always beset every tobacco planter. We hoped so because we adjoin the prosperous estate of Ranow, and the experience gained there by our managing director would, we thought, have entitled us to avoid the usual difficulties, troubles, and delays, and have placed us in a very favourable position. Things did not, however, quite turn out as we expected, and the reasons for it are given in our report. The chief one is the amount of sickness which seems inevitable in opening out these fresh plantations. We have been specially unfortunate in the loss of our head manager by death, and the sickness of one or two of the sub-managers; and I believe at one time that Count Charles de Geloes d'Elsloo, our managing director, was the only European left, and upon that occasion he manifested the greatest energy, taking the whole management on his own shoulders, and even went so far as to sleep out in the jungle to prevent the desertion of the coolies. (Cheers.) Although our first year's operations have not been so successful as we could have wished, we are extremely desirous that the shareholders should bear this in mind—that we are only in the same position as every tobacco company that has ever been started on the same lines as ours. Even those flourishing companies in Sumatra which now are paying their 50 and 100 per cent., every one of them had the same opening difficulties which we have passed through, and I do not believe that any one of these successful companies ever paid a dividend on the first year's working; the truth is this, that those who invest their money in tobacco plantations, although they most likely will receive most satisfactory results in the long run, must always be prepared to exercise great patience at the start, and if they do so, and courageously hold their shares, I tell them that in the end they will be glad that they were not frightened at the first temporary troubles. Perhaps some of you may think, from my remarks, that our particular part of the country is more insalubrious than elsewhere. That is not the case. I believe Mr. Crocker will tell you that our plantations are in the healthiest part of Borneo—(cheers)—and that this is simply the initial sickness that always comes when opening out fresh land in that part of the world. Now, I have in my hand a report which is made by a medical officer out in Borneo—made for the Government—as to the health on the plantations, giving details about the health of the coolies on the different estates. The report to the Government deals with the health of the coolies on eighteen estates scattered over the whole east coast. The writer says:—"It will be seen that the Maruda Bay estates head the list for healthiness, Ranow coming out absolutely best, the London North Borneo Company being No. 7 on the list." Again he says:—"The Maruda Bay at an average come out first. In looking for the reasons for this state of things the following facts are apparent. In Maruda Bay the ground is recent paddy fields for one thing, and, secondly, there is a large supply of meat food at low prices." Again, in the memorandum jutst issued by the North Borneo Company, I read the following:—"All the reports which have reached us hitherto are most encouraging. It is true several estates have suffered severely from sickness amongst the coolies, which seems inseparable from opening new estates in tropical countries; but it is encouraging to find by the returns that plantations which have been established the longest have suffered the least, Later reports speak of a general improvement in the health of the coolies on almost every estate, and the crop prospects are good everywhere."

I should also like to read you the latest news as to the Ranow estate; it gives a very favourable account as to the crop on the estate. It is as follows:—"The Ranow estate, when I saw it a few days ago was a wonderful sight. Tobacco stretching away for nearly a mile—all as level as a regiment of soldiers. There is hardly any sickness on the estate. It is expected the crop will average ten piculs per field." Now our crop, I am afraid, owing to the dfficulties, will not yield so well. At present we cannot tell for certain what it will yield. We had hoped to have had the accounts to-day from our managing director and to have told you exactly what the yield was. As I said, the difficulties we have had will affect the crop this year, owing almost entirely to the desertion and the sickness of the coolies, which prevented the land being got into proper order until too late. The early crops are always better, and this year our crop was not planted until very late. I mention the Ranow estate, as it is only simply divided from our

estate by a small stream. It is exactly the same kind of land in all particulars as our own, which should give exactly the same yield. I also mention the Ranow estate; they have gone through exactly the same difficulties and troubles as we have; they had a great deal of sickness there the first year, and the first crop was not very successful, I believe. They are now growing their fourth crop, which is so far good. The first crop was only a small experimental one; the second, grown after the formation of the company, returned no dividend to the shareholders. Last year the crop was good enough, I believe, to return a small dividend, and this year they have the crop, a description of which I have just read to you. (Cheers.) So good is the crop that they talk in Borneo of a return of 50 per cent. or even more to the shareholders. Now, I wish to point out that there is no reason why we should not have exactly the same results—(hear, hear)—in the same space of time as the Ranow estate. You will see in the report that we, the directors, have thought it wise to limit the cultivation of the fields to 800 fields. We have done so because the opening of fresh estates seems inseparable with the sickness of the coolies, and the loss of money. We shall keep opening out fresh estates, therefore, on as small a scale as possible. The coolies that we had last year were not very satisfactory; we have had to put up with some of the worst coolies. I hope we shall be able to adopt some better way in the future. We are completely in the hands of the coolie contractors in Hong Kong and Shanghai, who practically charge us what they like, and send out the coolies at so much per head. I am glad to be able to state that an organisation is being started in Borneo amongst the planters to try and get the coolies themselves firsthand, and not deal with the middlemen at all, if that can be adopted. We shall watch with great interest the trial of this plan, and if successful it will place us in a more favourable position in the future with regard to the coolies than we have been.

We expected from the natives considerable help; that is one reason, perhaps, why we have not done so well as we hoped to do, for the natives have not given us the help that we expected. The Borneo Government would, no doubt, had they not been harassed and troubled with a small war, have been able to help us by getting natives to work for us, and the natives would probably not have suffered, in opening up the ground, from jungle sickness and other sickness in the same way as imported labour. In one direction the natives have been a distinct hindrance to us. I believe that some of them told the Chinese coolies that if they would pay so much per head, they would promise to lead them back to Singapore. Having got so much per head, they led them into the thickest part of the jungle, and then left them, and went back to our managing director, telling him that they knew where the runaway coolies were, and claiming so much per head as the rewards offered for their recovery. (Laughter.) I think that those natives who get on the "windy side" of both a Dutchman and the Heathen Chinee have a future before them. (Renewed laughter.) The coolies that we have got now are of a great deal higher stamp than they were last year, but I am sorry to say that we have had to pay more for them. Labour in Borneo is generally very plentiful, but, of course, when the demand increases very suddenly, the supply is not always quite up to the mark. I have no doubt in the future that the supply of coolies will be quite equal to the demand, and that all the labour required will be forthcoming at a very moderate cost. Perhaps some of you may ask about the prices given now for tobacco, because so many new companies have started since our meeting of last year practically on the same lines as our own. Some of you may want to know, therefore, if the price is likely to fall. Well, there is no reason whatever to believe that, unless there are very much larger supplies than at present, the price is at all likely to fall. The demand increases year by year for this class of tobacco. Then the number of smokers in the world increases year by year. I see Mr. Chambers in the room, perhaps he will tell us something by-and-by about the prices for tobacco. (Hear, hear.)

The price during the past year has been satisfactory. You must always remember that Borneo tobacco is rapidly increasing in favour with tobacco manufacturers. (Cheers.) I should now like to refer to one or two points in the accounts. First of all, these accounts are for sixteen months. On reference to the profit and loss accounts, you will see £694 2s premium on reissue of the 210 ordinary shares not taken up by the original allottees. Now, there were some gentlemen in Java who wished to have shares, and they were applied for. Before we allotted one of the gentlemen died, and the other was unable to take them up, and the result was, under the advice of our solicitor, we considered that the shares belonged to the company, and we sold them, as you see, at a premium. (Cheers.) You will see in the balance-sheet, "Remittance to Borneo for the development and cultivation of the estate, £36,138 17s 8d." Of course, that is up to date (December 12); but up to October 1 last £21,000 had been spent on the estate, and of that £21,000 a very large proportion was for what may be called capital expenditure. Now, before I sit down I would like to say a few words about the land. The British North Borneo Company have already raised the price for their land to $6 per acre. That makes our land worth about £25,000; but our land is not like ordinary tobacco land. It is picked land—the best in Borneo. In fact, I may tell you that I cannot get 26,000 acres anywhere else in Borneo like it for tobacco planting. I may tell you that at the present moment we could sell a large portion of that land at $12 per acre. (Cheers.) This land, which we think is worth £40,000 to £50,000 at the present moment, has not cost a farthing of our money. We do not pay for this land until we ourselves has received 10 per cent. for our money. Now I think that there is no other company in such a favourable position as that. (Hear, hear.) We have the whole of our capital for the encouragement and growth of tobacco itself. There is no portion has to be put by for preliminary expenses, as the expense of floating the company was extremely small. I hopes with such a favourable position as that, our shareholders will not be disheartened by some little difficulties at first starting, but that they will hold tight to their shares. (Hear, hear.) If there are any question, I shall be happy to answer them, and I now beg to move: "That the directors' report and accounts from the formation of the company to December 12, 1889 be received and adopted." (Applause.)

Mr. Thomas Palmer Chapman seconded.

Mr. Joseph Cross said that he understood that the directors were not yet in a position to state to the shareholders with regard to the remittances of £36,000 to North Borneo for the development and cultivation of the estate. What proportion of that sum was on capital account and what proportion was on revenue account.

The Chairman said that up to Oct. 1 £21,000 had been spent, but more money had been spent since.

Mr. Joseph Cross said that he wished to divide the capital from the revenue expenditure.

The Chairman said that they were not in a position to show this at the present moment. They had had some accounts over, but they had not time to analyse them.—*L. & C. Express.*

AUSTRALIAN PRODUE FOR CEYLON AND TEA BACK FOR AUSTRALIA.

Ann ex-Ceylon resident writes to us by this mail:—"New South Wales, June 5th.—By the next Orient steamer my son is sending to Messrs. J. Auwardt & Co. a trial shipment of Australian produce, including butter, bacon, cheese, apples and calf skin leather, all, excepting the apples, being the produce of the famous 'Illawarra' district. Australian butter, to keep well, must be made in the winter: this is unfortunate for exporters, for the price of butter in the winter is often nearly three times as much as it is in the summer. It

will be difficult to send butter if it sells for less than R1·50 per lb. in Colombo, for not only is the price here high but the bottles in which it is packed are expensive, and the rate of exchange is also against the exporters. You will find the butter to be superior to, and the bacon and cheese equal to, the best now in use in Colombo. The farmers in the district have taken a great interest in this venture, and if it pays it will certainly be repeated. As the nett proceeds of these goods will be invested in Ceylon tea for the Indian market, planters and tea merchants should do their best to encourage the sale of Australian produce sent from Milton."

LIBERIAN COFFEE IN JAVA.

A gentleman who has just returned from Java has presented us with two magnificent Liberian coffee leaves plucked from trees two years old. They are 16 by 7 inches, and are larger than any ever seen in Ceylon we believe of their age. Our visitor reports quite a revival of interest in coffee planting in certain districts in Java. Both the Arabian and Liberian kinds are being freely cultivated and there is some talk of a Hybrid, of which he saw four plants said to bear a much more marketable bean than the Liberian tree. Dr. Treub of the Botanic Garden without disputing the fact of hybridization, refused to pass an opinion until the experiments were further advanced. Meantime, the coffee planters especially in East Java find that planting in shade, their bushes of Arabica do not suffer appreciably from the once dreaded fungus, while returns of 12 to 15 cwt. an acre are spoken of from the rich volcanic soil. While Government has retired very much from coffee culture, private planters are likely to make up the deficiency. The Liberian coffee is also very free of the fungus although some planters have considerable areas under cultivation, the trees growing to 20, 25 and even 30 feet high, a pruning knife never touching them. They go on bearing all the year round and the Java planters profess themselves well pleased with their harvests which average 10 to 12 cwt. clean coffee per annum. One great advantage of the Liberian kind to the Java cultivator is that it grows readily on old coffee land—land abandoned during the height of the fungus panic. The only enemy at present dreaded by the cinchona and tea planters in Java is the *Helopeltis antonii* which does not trouble their cacao, but revels in their tea especially. Our present visitor heard of tea crops being greatly affected by the ravages of this insect. In cinchona, he also saw and heard of great mortality through a fungus attacking the roots, to check which the planters were using a dilute solution of corrosive sublimate.

How the coffee exports have run, may be seen from the following extract from a recent authentic report on the Export Trade of Java:—

COFFEE.—The export of coffee, which amounted in 1889 to 24,281,000 kilos., contrasts not unfavourably with the last four years, when this export amounted to:—1885· 14,646,000 kilos.; 1886, 16,668,000 kilos·; 1887, 13,377,000 kilos.; 1888, 22,612,000 kilos.; but in the preceding year, the export figures amounted to—1881, 23,093,000 kilos.; 1882, 24.135,000 kilos.; 1883, 32,369,000 kilos; 1884, 24,400,000 kilos. Under the above figures are included an amount of 100,000 piculs, or 6,176,000 kilos. Government coffee, sold every year at Java, which amount, therefore, must be deducted from the figure of the export to obtain the export figure of the coffee grown on private account. Regarding the production, the following statements are given in the yearly colonial reports. (A shows the estates on grounds leased by Government to private persons; B, the private estates west of the Tjimanok, and C, the estates on leased gronnds in both the Vorstenlanden, Soerakarta, and Djokjakarta):—

	A	B	C	Total piculs.
1879	93,000	27,000	90,000	210,000
1880	72,000	9,000	85,000	166,000
1881	154,000	11,000	101,000	266,000
1882	172,000	30,000	71,000	273,000
1883	203,000	14,000	121,000	338,000
1884	199,000	24,000	36,000	259,000
1885	167,000	15,000	37,000	219,000
1886	225,000	27,000	21,000	273,000
1887	126,000	9,000	23,000	158,000
1888	298,000	13,000	30,000	341,000

STRAITS SETTLEMENTS: PAHANG NEWS.

(*By an ex-Ceylon Resident.*)

Pekan, June 21st.

The meeting of Pahang State Council was held some time back at the *Sthana Rvpa* (in Malay, the Palace of the Sultan). The meeting was opened at 5 p.m. It consisted of His Highness the Sultan, Ahmad Muatham Shah Ebni êl Marhom Ally, who took the chair, Tunku Mohamed, the Regent of Pahang (son of Sultan), Raja Muda, the Sultan's younger brother, Orang Kaia Cheno-Unku Andah, Tuan Hitam-Tuan Hakim, the native magistrate, Orang Kaia Bakti, the late Treasurer of the State, Unkn Bandahara and a few of the native Rajas and leading headmen, and Mr. J. P. Rodger, the British Resident. Amongst the subjects that were brought before the meeting for consideration, the question of slave trade was one of importance. After a long debate it resulted in the modification of the very stringent rules which are in force now. Having been approved and passed by the Council many suggestions made by the Resident for the improvement of the country, the proceedings were brought to a close at midnight.

Though the country was only bronght under British protection in July last year, it is rapidly progressing, due to the immigration of foreigners, specially Chinese from China, Canton, Hongkong, Singapore &c.

THE "PAHANG CORPORATION," a Tin Mining Co. at Knantan, have already commenced operations in opening np a railway line from Knantan to Temerloh, and then to Lipis (a distance of some scores of miles inland), and then connect this line to that of Kwala Lompor, thus having one line of railway right straight np, from the western to the eastern shores of the Peninsula. This, in all probability, will answer for the better development of the gold, &c., mines at Lipis, and save large amounts of money which other mining Co.'s expend, for transport of materials, produce, &c., from, and to the mines owing to the present inaccessibility to certain parts of the country, as the River (the only way open for communication) when going higher and higher in the mountain districts, is not open to navigation—thus necessitating all passengers who go to the remote mines make the best of it through forests at great risk to health and sometimes to life itself.

MANY CONCESSIONS OF LAND (within the State) some extending over 100 square miles, have been granted by His Highness the Sultan, for working of gold, silver, lead, tin, &c. mines, both to European and native capitalists. Most of these lands were nntouched by the grantees, perhaps taking advantage of His Highness' inexperience regarding the development of a patch of gronnd for mining purposes, when the time soon approached in July last, on the most unexpected arrival of a British Resident in the State, for, every such grantee to put his respective patch of ground in proper working order and to have on the spot necessary machinery for crushing, smelting, washing &c. of all minerals that may be found on such land, and much more when the "Pahang State Mining Regulations" came to force at the sanction and approval of Sir Clementi Smith, Governor of the Straits, in February last, which were most ably drafted out at the approval of the British Resident, by Mr. W. P. Townson, in an Australian

tone which sounds well for Pahang. This ground possesses various kinds of metals and auriferous minerals and as it is required by a certain clause of the regulations, if all the mines are effectively and continuously worked, this State will be the foremost in the Peninsula, and increase the Revenue of Government in abundance.

June 1st.

His Majesty the King of Siam is shortly expected at Pekan on his way from Bangkok, visiting Kelantau, Trengganu, Keta &c., Malay tributary States to Siam. His Majesty's forerunners Phya Babanuwanse and Phya Chandrawangsa, have touched Pekan on their way down the coast of the Gulf of Siam reparing the way for their Siamese Majesty.

A DISEASE OF THE COFFEE-PLANT.

A report has been prepared by M. Adolf Vendrell, a member of Belgian and Spanish agricultural societies, by order of the Government, on a disease that has attacked certain coffee plantations in the department of Amatitlan, Guatemala. The department of Amatitlan, consisting of some 200 square miles, has an elevation of some 3,990 feet, and in former years the principal industry was the cultivation of cochineal. On the decline of this industry it was succeeded to a great extent by coffee. Owing to the impoverished state of soil, defective cultivation (it not being the custom to manure the land), and, perhaps, the want of depth of soil, the coffee plantations of Amatitlan have not been famous, nor have these crops ever formed any great proportion of that product of Guatemala; and in 1880 to 1882 a disease appeared on the coffee plants, to which the planters at the present time attribute an annual loss of 50 per cent. of their crops. M. Vendrell states that this disease is an insect, nothing more nor less than a new species of cochineal * that has adapted itself to a different existence. The insect, he states, is a standing menace to the coffee industry, as at certain stages it is easily dispersed and transported by the wind to other plantations; and he implies that, although the present species does not thrive on, or affect to any great extent, luxuriant and healthy plants, yet it may adapt itself to other conditions. He recommends the intervention of Government to enforce the destruction of the insect, and suggests the manuring of the land with nitrate. It is considered questionable whether the production of coffee in Amatitlan would withstand the charges of a higher cultivation, should there be any considerable fall in the price this article at present controls; and also whether, without Government intervention, the agriculturists of that department would take effective measures to prevent the spread of the disease.—*Grocer.*

A New Industry, the manufacturing of malt vinegar, has been started in Dunedin, where a firm have a plant of work capable of turning out 500 gallons a day.—*Australasian.*

Tea in Mauritius.—On at least two occasions the authorities in Mauritius have asked that a Ceylon planter should be nominated to take charge of a Government experiment in the introduction of the growth and manufacture of tea. On both occasions gentlemen were recommended and appropriate salaries indicated and we believe that each case has been with curious discourtesy, left without reply from the sugar isle. Now we find the following paragraph in the proceedings of the Legislative Council:—

Laying a report by the Chairman of the Experimental Plantations Committee, relative to the employment of an experienced Tea curer for the Experimental Farm, and requesting the Council to vote the sum necessary to permit of the temporary employment in that capacity, of Mr. J. Oorson, on the terms recommended by the Experimental Plantations Committee.

* That is, a scale insect or bug.—Ed. *T. A.*]

CEYLON TEA IN AMERICA.

"As I know them, the American citizens are the most ignorant people I have met. I refer to the New York citizens. ''Tis true, 'tis pity.' I have known them now for six months."

Such is the opinion of an advocate of Ceylon tea, who dispensed samples from a "tea kiosk at the American Institute Fair, from 10 a.m. until 10 p.m." During the process the poor fellow was "in deep mental distress; his nervous system overstrained, his emotions distorted. While he smiled pleasantly outwardly, he wept and—worse inwardly, and went through a most terrible ordeal."

All of this mental contortion, emotional dyspepsia and soul torture came from a dietetic discovery. The critic says —

"I had no conception that a people could be so woefully ignorant about a daily article of diet as these people are of tea. 'Oh, 't is pitiful!' Vast numbers think it is manufactured, and I dare say they are right, for your Yankee can manufacture anything. I must give him that credit. Let us 'give the devil his due.'"

This Ceylon missionary interested in the Gospel of Tea, has come, to use his own words "to save, to teach, to educate, and to tell what tea is, to induce them to leave the ensilage, which they have been enjoying so long (Oolong tea)—to drink really pure tea, quite an unknown quantity in this country." The task is recognised as "herculean." Undoubtedly so to one who does not appreciate the relation of climate to beverages, and that the two national drinks are coffee and beer, the former being the most popular and enticing. But our critic is heroic, and undaunted by difficulties. He tells us "the combat promises to be severe" but the effort is well backed by "British pluck, enterprise and capital," the latter indispensable and without which the Ceylon effort will be "utterly helpless." In order to keep the enterprise supplied with Ceylon gold, the tea planters are told in a letter to the *Ceylon Observer* about the efforts being made in this city to sell Ceylon teas and the difficulties to be overcome. This document is interesting, as it affords an opportunity to "see ourselves as others see us." Our critic, after describing the store that has been opened and its manager, proceedeth to fish for the golden-ducats of Ceylon, an island of which, he says, "perhaps two-thirds of the citizens of New York never heard; the remaining third probably from their hymn books," in this manner:—*American Grocer.* [Then follows a long extract from our correspondence columns. —Ed. *T. A.*]

MADRAS TEA AND COFFEE CULTIVATION.

During the year 1889 there were 110 Tea plantations in the Madras Presidency with an approximate area of 7,272 acres, which yielded a total of 884,916 lb. of tea. Ninety-eight of these plantations are in the Nilgiri District, 7 in the Malabar Wynaad, two in the Madura District, and three in Bonanghi tanna of Srungavarapukota Taluk of Vizagapatam District. Although about $8\frac{1}{2}$ acres have been planted in the last three estates there was no yield, in consequence of the crop not being harvested as the plant is not thriving. The average yield per acre of mature plants was 400 lb. in the Malabar Wynaad, 190 lb. in the Nilgiris and 10 lb. in Madura.

The number of coffee plantations was 15,478, with an area of $184,125\frac{1}{2}$ acres and an approximate yield of 12,382,580 lb. of coffee. This industry was confined to the districts of Malabar, Madura, Nilgiris, Salem, Tinnevelly, Coimbatore, South Canara, Vizagapatam, and Anantapur. Malabar heads the list with 10,471 plantations with $90,647\frac{1}{2}$ acres; Madura has 4,183 plantations with 6,065 acres; Nilgiris 695 plantations and 82,125 acres; Salem 49 plantations in the Javadi and Yelagiri hills with about 25 acres; Tinnevelly 49 plantations with 2,650 acres; South Canara has 8 plantations with about 71 acres; and Coimbatore 18 plantations with 1,808 acres. As with tea the coffee plan-

tations in Vizagapatam are confined to Bouanghi tanna. where there are three plantations over an area of 710 acres. There are two plantations in the Anantapur District, one at Sidhaghiri and the other at Madaksira. The one at the latter village was opened out during the year and is the first attempt to grow coffee in the village. The two acres planted at Sidhaghiri yielded 180 lb., the average yield per acre of mature plants being 720 lb., the best in the whole presidency. The average yield per acre of mature plants in the other districts were Nilgiris 312 lb., Coimbatore 276 lb., Madura 152 lb., South Canara 143 lb., Malabar 127 lb., Salem 76 lb., Vizagapatam 69 lb., and Tinnevelly 9 lb. Several plantations in Malabar and the Nilgiris which were neglected and decaying were taken up again owing to the rise in the price of coffee. It is expected that the out turn this year will be in advance of the results obtained last year from the same cause.—*Madras Times.*

A TURTLE FAMINE IN LONDON.

As long back as June 1st, 1887, we devoted an article in this journal to suggestions as to the possibility of developing a market for the output of the turtle fisheries in the north and south of this island. We cannot say that what was then written was productive of any appreciable effect but we are not disinclined to think that some stimulant in that direction may be afforded by the news reaching us by last mail that London has been left almost entirely without any supply either of fresh or of dried turtle !

We think it very possible that the greater bulk of our readers are unaware of the really enormous demand which usually exists in that great city for both of these articles. Leaving out of consideration the section of this demand which arises out of convivial gatherings among the wealthy classes and for the more ceremonious banquetings of the great Civic Companies and similar Public Associations, it may be said that by far the larger quantity of the turtle reaching London either in a quick or dried condition is consumed as a nourishing restorative during or after debilitating illness. Turtle soup is, indeed, one of the most constant recommendations made by the doctors at home to their well-to-do patients. The price charged for this, either as freshly made soup or as a tinned preparation, is very high, and ranges quite beyond the means of the poorer among the sufferers from illness. We have learned that in the case of a friend recovering from severe illness, he reckoned that each breakfast cupful of turtle soup cost him three shillings at least, and that for the fresh soup from Gunter's he had to pay half-a-guinea a pint. What the price may have gone up to during the late famine of turtle in London we can hardly hazard a guess. Possibly it may have risen as exorbitantly as did the price of quinine in Mauritius during the severe outbreak of fever experienced some twenty years back in that island.

Without enlarging further on this point of costliness of the article, we believe we have demonstrated how high a value may be obtained for it at home and how very steadily expanding is the demand. From some cause or other as to which we have no information, the ordinary sources of supply hitherto relied upon have of late years shown symptoms of drying up. Chiefly, the London market has been dependent upon the turtle harvests of the West India islands, and these—possibly for want of an enforcement of a close time during the breeding season—have of late become very restricted. Irish Home Rulers are fond of quoting an adaptation of an old saying to the effect that England's distress may be Ireland's opportunity. May we not plagiarize upon this, and say that London's distress (as to its turtle supply) should become Ceylon's opportunity ? We note that it is remarked that "there is but little flesh on a turtle" as the reason why the retail price is so largely in excess of the wholesale buyer's rate of purchasing. From what is known locally of the turtle in the Colombo, Matara and Jaffna markets, we should not be disposed to agree to that statement. They appear usually to us to be full of flesh, and that of a highly nutritious quality throughout. We suspect that it is the cruel system of leaving the poor creatures without food all through the long journey homewards which accounts for their shrunken state on arrival. It is much to be wished that an experiment could be made in the conveyance of live turtle from Ceylon to England. During the voyage they might be cooped as are fowls and ducks and regularly sluiced with sea water and supplied with food. It is cruel and wasting to lay them on their backs with the head hanging down during a month's journey. We believe that, with proper care, turtle might be landed in London from Ceylon in almost as good a condition as when shipped, and if that were accomplished, no more profitable venture—at least at the present juncture—could be made than that of supplying the London market from our local breeding grounds.

IRRIGATION:—A SPECIOUS BUT IMPRACTICABLE PROJECT.

The Ulsoor Tank which supplies water to the Bangalore cantonment is the subject of a letter in the *Indian Engineer.* The writer is troubled about the loss of water from evaporation but especially from absorption into the soil, described as decomposing felspathic rock, exceedingly porous and friable. The remedy proposed is thus indicated:—

Can these underground streams be tapped in any way ? If there are no impermeable strata within a moderate depth from the surface cannot something be done to make the gathering ground more or less impermeable ? I will cite one method, proposed by M. Seguin, which, though only generally applicable to small areas, could be modified for adoption on large areas of several square miles. I translate from De. baune's "*Distributions d'eau*" where M. Seguin's article is quoted. "Take a piece of land 3 or 4 acres in extent, where the soil is sandy, such as may be found in the Bois de Boulogne or in other woods around Paris, and which besides has a slight slope in some one direction so that you may at once get a flow of water. Excavate along its whole upper length a trench 4½ to 6 ft. deep and about 6 ft. wide. Level the bottom of this trench and make it impermeable by macadamising it or by flooring it with asphalte, or, simpler still and less costly, by puddling the bottom with stiff clay. Alongside this trench cut another similar one, throwing out the earth to fill the first one. Treat it in the same way and then continue the process till you get a sub-soil completely impervious to rain water. Plant the land with fruit trees and especially with trees with low-hanging branches; which will shade the ground and will arrest currents of air that would tend to cause evaporation. Then at the lowest level of your land build a wall down to the artificially prepared sub-soil into an opening at the centre. You will infallibly find that you have here a fine spring which will flow without intermittence." My readers may perhaps here say, "Ah ! this proposed method has quite a pastoral ring about it, but is quite impracticable on 5 square miles of drainage basin." Modified, I believe the method would be eminently practicable. Fill up all fissures on the higher parts of the basin, where fissures probably around, and then, after close examination of the ground and of the directions of flow of the sub-soil water, dig

trenches in the way suggested and make them impermeable so as to lead the water into the tank where it is so much wanted. There may be insuperable obstacles to carrying out any such proposals to increase the run off into the tank; but if there are not, an expenditure which I might calculate at R30,000 to R50,000 a square mile or 1,50,000 to 2 lakhs in all, would give a supply ample to meet the present requirements of the town and render unnecessary for many years to come larger and much more costly schemes.

We submitted the above to one of the most eminent of our many competent and accomplished hydraulic engineers, whose deliverance is as follows:—

"The correspondent boldly recommends an expenditure of R150,000 or R250,000 over what would be only an experiment, and he adduces no facts in favour of it. I should say that no one is likely to try the French proposal on a large scale.

"According to the description of the soil of the drainage and of the Ulsoor tank I should be surprised if such works as the correspondent recommends were to materially augment the existing water supply. He cannot be an engineer, or he would not write in such a child-like manner regarding the filling up of 'all fissures in the higher part of the basin.' He states that the water 'cannot possibly be all evaporated,' but he brings forward no evidence in support of this opinion. During 6 months of the year, the *total* rainfall is under 6 inches, so that in this period the soil may become parched to a great depth, and ready to act as a sponge when the S.-W monsoon rains fall.

"No doubt a great amount of water is wasted in Ceylon by passing under the embankments of the tanks, there being no puddle-trenches to intercept it. According to the correspondent's ideas it would be a very simple matter to stop to this flow and waste; but the expense would be very great,—probably more than the water is worth."

In April 1887, when, recording the impressions created by a visit to the Kalawewa tank, we specially noticed this question of percolation of water through the brands of tanks and the sides of canals, as requiring legislation such as was found necessary soon after the great Ganges canal was opened. Cultivators of lands adjoining the banks were equitably charged for the water which kept their fields perennially moist although it was not supplied directly from sluices. Nurseries of forest trees ought to exist under all our great tanks.

TASMANIAN APPLES.

(From the *Aberdeen Free Press*.)

June 12th.

Passing down Market Street yesterday I saw some beautiful apples in a fruiterer's window ticketed—"Tasmanian apples, grown and packed by S. E. Shoobridge." This is one product in which Tasmania can compete with any part of the known world. I have never seen better apples or better crops anywhere else; and, coming in at this season of the year, the export to this side ought to prove profitable. Apples will grow abundantly almost anywhere in Tasmania, but the favorite district is the Huon, 30 miles south-west of Hobart, where the soil and rainfall are pecularly suitable. The trees are planted 20 feet apart, and after the sixth year will give average crops of 500 lb. up to the 14th year, when the yield begins to fall off. The orchards of the Messrs Shoobridge are, however, on the banks of the Derwent—a rich spot such as cannot be found anywhere else in the island. Amongst the eldest colonists the father of the Shoobridges went out "of his own free will" some 60 years ago. An intelligent, upright, and downright good man, he taught his sons habits of honest industry which ought to have been a pattern to all other settlers and a fortune to themselves. While other farmers treated the poor assigned convict servants as beasts of burden and worse—frequently sending them to get lashes instead of wages due—the Shoobridges invariably treated them with kindness, were well served and well they prospered. Years ago they went into hop culture and I have seen as many as from 4000 to 5000 busy fingres picking their crops. But hops have caused to pay and these enterprising men are now turning their attention more exclusively to apples. The apple—like every other living thing—has its enemies, chief among which is the Codlin Moth (*Carpocapsa pomonella*). Like many more of our troubles the Codlin Moth is the sequel of sloth. In Europe orchards are, as a rule, kept cultivated and clean so that when an embryo moth falls from an apple a bird can pick it up, but in most of the so-called orchards of Tasmania this is impossible; and the worst of it is the most careful cultivator suffers by the garden of the sluggard.

Coloniensis.

TAMIL COOLIES AT THE STRAITS

The Indian Immigration Report for last year shows that the indentured inflow during that period stood at 2,747, a falling off amounting to 40 per cent compared with the figures for 1888. Decrease also has taken effect slightly on the arrivals of immigrants not under indenture, who reached the aggregate of 15,285. The Protector has taken measures aiming at a change for the better in this respect, and hopes to see matters further righted by curtailment of contract time and a rise in wages. In his opinion, low pay turns the weaker coolies into starvelings and incites to desertion, which also largely arises from the contract time being fixed at three years. It is alleged that the length of the term of service under the strict discipline of an estate discourages this class of coolies even to the point of death.—*Straits Times*.

THE GOLD TRUST AND INVESTMENT COMPANY:

A BIG DIVIDEND.

[We are indebted to a correspondent for calling our attention to the extract in the London *Globe* of June 6th with the above headings. The Company is a prosperous one, and as may be seen, it has been doing work for Ceylon.—Ed. *T. A.*]

An ordinary general meeting of the above company was held this afternoon at the offices, No. 184, Gresham House. Mr. P. E. Lintilhac presided, and in moving the adoption of the report, which showed that there was a balance of profit of £12,857, and that the dividend for the year was equal to 32½ per cent., said the result must be considered satisfactory when they remembered that for the greater part of the year the mining market had been greatly depressed; but still, the depreciation in the value of shares held by the company did not exceed £3,000. The company were entitled to a considerable amount of commission for making the issue of the Persian Investment Corporation, which amount was not taken into consideration in the company's accounts until received by them. The directors, after very careful consideration, had undertaken the formation of the Gemming and Mining Company of Ceylon (Limited). This company, although only issued a short time since, already looked like being a great success, and the directors had thought it wise to retain a considerable interest in the undertaking. The board might be considered rather conservative in their views, but they thought it wise not to take credit in the balance for any moneys not yet received. The shares of the company were highly

thought of both in London and on the Continent; and the £1 shares were now quoted at £12 premium. There was also every prospect of an even better dividend next year.—Mr. S. Bernard seconded the motion, which was unanimously agreed to, and the usual formal business transacted.

LOWCOUNTRY PLANTING: NEGOMBO.

WEATHER—CINNAMON—COCONUTS.

KADIRANA, July 1st.—We are badly in need of rain here. May was a dry month and June was worse; the former had 3·64 inches and the latter 1·61 inch of rain; so that for the south-west monsoon this year we have had only 5·25 inches. Even in the earlier months of the year there a smaller rainfall than usual. For the previous 4 years the average fall for the first six months of the year has been 44·50 inches, against 23·09 this year. Colombo, I see, for the same time has had over 33 inches, while the record on one estate in Veyangoda is a little over 60 inches. These three stations, all in lowcountry, and within about 18 miles of each other, show how unequal is the rainfall distribution. All estates are busy preparing cinnamon, but unless we have rain soon the peeling is likely to become difficult. Coconut crops all over the district are, I believe, better than they were last year, while prices continue to keep up. Can you say why coconut poonac has been so high in price for about twelve months past?

THE FORESTS OF EUROPE.—The forests of Europe according to a recent report of one of the State foresters of Prussia, cover the following areas:—Germany, 34,596,000 acres; Russia, 494,228,600 acres; Austria-Hungary, 46,951,700 acres; Sweden, 42,000,000 acres; France, 22,240,000 acres; Spain, 19,769,000 acres; Italy, 9,884,570 acres; and England, 2,471,000 acres.—*Public Opinion.*

THE PENANG SUGAR ESTATES CO., have recently got out a lot of machinery of the newest type for the manufacture of sugar. They have also fitted up their sugar factory at Caledonia with electric light, which was used for the first time on Saturday night and proved a great success. There are eighteen arc lamps of one thousand candle power each, which are worked by two Victoria dynamos supplied by the Brush Co. of London.—*Pinang Gazette.*

JAVA CINCHONA EXPORTS.—In respect of cinchona bark, the Java exports have been much more progressive than in the case of tea, as may be seen from the following figures:—

	lb.		lb.
1884 ...	447,000	1887 ...	2,429,000
1885 ...	1,074,000	1888 ...	3,588,000
1886 ...	1,836,000	1889 ...	4,965,400

Seeing that Java bark analyses about double the average for Ceylon, last year's export was equal to 9,930,800 lb. of our bark. During the current year, the exports of bark from Java show a further increase and may reach 5½ million.

BUCHANANIA LATIFOLIA.—Read the following letter from Surgeon-General G. Bidie:—"In the July number of the Society's Proceedings I see a brief but interesting notice of the seeds of *Buchanania latifolia.* They are very commonly used by natives as we use almonds. When Sir M. E. Grant Duff visited Cuddapah they were brought to his notice (by, I believe, Dr. Iyasawmy Pillay Rai Bahadur), and he, recognising their great merits as an after-dinner dainty, introduced them at Government House. In this way their use became more general at European tables. They have a delicate nutty flavour, and the only defect that I know in them is that they do not keep very well, being apt to get mouldy. They are known in the local market at Cuddapah as *Chara pappu bijam*.—*From Report of the Agri-Horticultural Society of Madras, Sept. 1889.*

VITALITY OF SEEDS.—I wish to place on record one instance more, illustrating this point. Twelve months ago I sowed a seed of Abrus precatorius, or the Liquorice tree. This was one of several others of the same kind which I know to be twenty-five years of age. I have had the seeds since the beginning of 1879; and the gentleman who gave them to me grew them in the West Indies, and he left there in 1855. The seed sown, as mentioned above, has vegetated this spring, and is growing vigorously.—G. PAUL, Knaresborough.—*Gardeners' Chronicle.*

AN HISTORICAL PALM TREE.—Visitors to Rome in past years who remember the gardens of the British Embassy, will be interested, says the *Times*, to learn that the Palm which stood in them, and which was not only the tallest in Rome but was historical, as having been pierced by a cannon ball during the attack on the city in September, 1870, has been blown down during a gale. It was strapped with iron where the ball had pierced it, and was the only object in the vicinity which showed the traces of the attack which opened Rome to the Italian army.—*Gardeners' Chronicle.*

PROFESSOR OLIVER.—It is with much concern that we have to announce that Professor Oliver resigns his post as keeper of the Herbarium of the Royal Gardens, Kew, at the end of this month. Professor Oliver has been connected with the Herbarium for about thirty years, and it is quite impossible to overate the services he has rendered to botany, and, incidentally, to horticulture, during that period. The Professor's modesty and retiring habits have prevented him from becoming so widely known to the general public as his merits warrant, but among botanists there is but one feeling of the highest respect for his perfectly unique knowledge, and of gratitude for the readiness with which he has always used it for the benefit of science and the public. We are glad to learn that the Professor will continue to reside at Kew, and to lend his invaluable assistance as Editor of the *Icones Plantarum* and in other ways.—*Gardeners' Chronicle.*

A SWEET ORANGE-POMELO is noticed in the *Florida Dispatch, Farmer and Fruit-Grower.* The grower writes:—

The fruit of this tree varies considerably, some individuals being as sweet as an orange and others almost as sour as the average grape fruit. Please sample these and see how they compare with the best that you have eaten. For my part, at this season, I prefer them to oranges, either sucked or cut through the equator, sprinkled with sugar and placed upon a glass for breakfast. I am strongly inclined to think them wholesome, and think that they need but to be known in order to be appreciated.

The editorial opinion is:—

The samples were very firm and smooth, though slightly rusted, but nobody could quarrel with their interiors. The only bitterness was in the core; the pulp was deliciously sweet quite to the rind, with a slight suggestion of coconut flavor.

Fancy a pomelo with coconut flavour!

PROFESSOR EISEN'S REMEDY FOR COFFEE LEAF DISEASE does not seem, from his own account of it, to have any marked superiority over Mr. D. Morris's remedy of sulphur and lime. That killed the fungus where it was applied, and this is all that is claimed for the professor's remedy. Our experience in Ceylon proves that no remedy short of complete extirpation of the ubiquitous fungus can be of any avail. The Professor had better address himself to the Government of Java, where coffee is still more of a staple product than, unhappily, it now is in Ceylon. Professor Schrottky was as fully satisfied in his own mind of the merits of carbolic acid as Professor Eisen is of the success of his simple remedy. But that is not enough. We fear the only remedy is effluxion of time and the extinction of the fungus with the disappearance of that which it feeds on. Then a non-fungus cycle may set in and coffee be once more profitably cultivated.

NORTH BORNEO NOTES:

PERSONAL—PEARL SHELLS—FLAX—SAWMILLS.

(From the *North Borneo Herald*, June 1st.)

Mr. E. P. GUERITZ who some seven years since was Assistant Resident in Kudat, and who left the service in 1884 has again entered under the Company's rule, and will take charge of Labuan, Mr. F. G. Callaghan being about to proceed to England on six months leave of absence.

In this issue we publish a most interesting lecture on the State of North Borneo its past, present and possible future given by Mr. Alexander Cook Treasurer-General before a meeting of the British Association at Newcastle on Tyne on September 10th last during his absence on leave in England last year. There is one slight correction which it may be as well to make. Mr. Cook states that during Captain Beeston's second Segama Expedition of 1887 the prospectors did not discover any "matrix" of gold but only the loose gold in the beaches. This is not quite correct. On both expeditions of 1886 and 1887 Captain Beeston successfully treated quartz for gold, finding the quartz very heavy with baser minerals. In 1887 several quartz reefs some of large width were found in the creeks above Weary George where the slate and diorite country came in. Samples from these were reduced to powder and washed a very fair prospect being the result.

It seems that attention is being given to the coast of British North Borneo as a suitable field for the pearl-shell fishing industry. The following extract is from a letter received by a firm at Thursday Island from one of the leading London brokers. The Torres Straits fishers referred to are probably from the North-West —"It has come to our knowledge that some Torres Straits fishers have been applying to the British North Borneo Company for leave to fish on the coast of that Island, and we think it well to call attention to this new ground, as we have seen some of the boldest and finest shell from there, and think it likely to have grand opportunities."

We append translation of a letter addressed to us by the Manager of the *Société de la Ramie Française*. All the samples alluded to can be seen at the office of the *North Borneo Herald*:—

Sir,—We received your letter of the 18th December and thank you for the flattering compliments with which you addressed us. According to your wish we are sending you, by this mail, patterns of ramie in the divers states in which it is ntilised.

I. Stalk of driod Ramie.

II. Ramie unravelled by Chinese hand labour, and worth, in the European markets from 80 to 85 francs, per 100 k'los.

III. Ramie unravelled when green by the machine P. A. Favier, and worth in the European markets 40 to 45 francs per 100 k'los.

IV. Ramie unravelled when dry by the machine P. A. Favier, worth 70 to 75 francs per 100 k'los. in the European markets.

We add to these samples, some specimens of flax, after undergoing a certain preparation, and also some samples of tissue. We are also sending you some pamphlets appertaining to the culture and machines for working ramie. We are convinced that there is much to be done with the ramie but in a damp climate the disentangliug cannot be promptly effected unless through the agency of our machinery, working it in its crude state that is to say immediately after the cutting of the stalk. If any powerful company would undertake the first cultivation of the ramie, we could easily come to an arrangement with them and would be willing to allow them the monopoly of our machinery, at the same time we would be assisting them at arriving at a result. As to our being able to give you an idea as to what revenue would result from the undertaking on a proper scale the following information may be useful. In a climate like Borneo *three* crops of ramie can be thoroughly calculated upon in one year, each crop should give from 13 to 14,000 k'los. of green stalks per acre which after undergoing treatment with our machines would give a return of 2,000 k'los of strips like the pattern herewith; we are buyers of these strips at the rate of 40 francs per 100 k'los; this would represent a gross return of 800 francs per acre. One machine with two workmen could produce 2,000 k'los in a space of from 6 to 8 days. The power of the machinery does not come up to one horse power. The royalty we should ask, to give up the right of this patent would only amount in any case to 0:. 75c. for every 100 k'los so unravelled. The material so delivered should be received free of all port charges in any European port, and the bales so delivered should average from 200 to 250 k'los to the cubic yard, the total cost of the machine amounts to 2,000 francs and we shall be very happy if this question should prove sufficiently encouraging to induce any of the companies in British North Borneo to take the initiative in developing this new industry which would certainly conduce to the profit of both grower and buyer and might develope into an industry of considerable importance. A. FAVIER.

We publish the following communication with much pleasure, as it indicates the progress of the Saw Mill industry in Sandakan at the present time.

During the recent visit of His Excellency the Governor and Mrs. Creagh to the Saw Mill and Engineering Departments of the British Borneo Trading and Planting Company, it was the general subject of remark that energy and determination combined with sound practical knowledge had worked great changes in the prospects of these Departments, during the past few months, and what was formerly a ghastly mangrove swamp with a drowned Saw Mill in its midst was gradually assuming the appearance of a business centre, all the Saw benches in the Mill being hard at work on the execution of a large order for Railway sleepers for Manila, which are being turned out at the rate of 500 per day, and for which purpose the timber is specially adapted.

The energetic Manager Mr. W. A. Leach is at present busily engaged on the reconstrnction and extension of the Saw Mill Wharf, which when completed will be 550 feet in length and will allow vessels drawing 18 feet to come alongside at dead low water. Another Wharf 500 feet in length is also in course of construction for the Engineering Department and alongside of this it is in contemplation to erect a patent Slipway for hauling launches and small steamers, and which will in junction with the New Machine and Boiler makers shops and Iron and Brass Foundries enable the Company to undertake and successfully carry out extensive repairs of all descriptions. In the course of conversation with the Manager that gentleman (who has had seven years' experience with Teak timber in Siam) expressed his opinion that Billian was for many purposes far superior to Teak, and could be supplied at ⅔rds of the cost of that wood, the forests which in Siam are in some instances 500 miles from the port, being an important item in the cost of production. Kayu Kapur or Camphor, and Kruen or Borneo Teak, are also woods which in his opinion are quite equal to Teak for ship-building and other purposes and can be supplied at little more than half the cost of that wood. Altogether the Company is to be heartily congratulated on its improved prospects and there can be little doubt that when the quality of the magnificent timber which abounds on the property of the Company, becomes more generally known, the present Milling plant will have to be further increased in order to supply the demand which will certainly exist for it.

The Government is corresponding with more than one of the leading members of the Western Australian Pearling industry who want to bring up a fleet of schooners to fish on our East coast during the Australian winter months when the inclemency of the weather prevents them from leaving the ports of that colony. For the information of those who are interested in the business we may say that the first comer has been offered the privilege of exporting pearls at half the ordinary export duty (*i. e.* at five instead of ten per cent) for seven years from the date he starts business. This privilege covers a fleet not exceeding twenty ordinary pearling schooners. Not only the mother of pearl shell of very fine quality, but also the real pearl oyster have been found off our East coast, but neither variety is regularly fished: both inhabit deep water and none of the natives understand dredging.

The Government is endeavouring to attract some of the pearl dredgers from Sulu but hitherto although they accepted the terms offered they show no disposition to come although some of their chiefs believe our East coast to be quite as rich as any other in the Sulu Sea.

CEYLON UPCOUNTRY PLANTING REPORT.

WEATHER—PEPPER-GROWING—LIBERIAN AND COORG COFFEE—ARABIAN COFFEE FREE OF LEAF DISEASE THIS YEAR.

July 4th.

Our present weather is simply too much of a good thing, and although Ramasami pretends to be up to a dodge which could bring about a change —that of having a day's outing with Muniandi, at the master's expense, rain to be certain after that!—things have not reached that point of despair with us yet, that would justify the adoption of it. Nevertheless it looks very like as if the south-west monsoon of 1890 was to be lost to Ceylon. It does not tend to make matters any more bearable to hear that other places were getting their S.-W. rain all right; and that at sea the weather is heavy with rain and to spare. Our monsoon must have gone galavanting somewhere, breaking through its character for steady respectability by thus adopting a profligate career. I wish it would repent and come back. It would be as welcome as the prodigal, and as rejoiced over. In these districts our streams are getting lower and lower, the rains we have had, proving wholly insufficient to meet the strain of such dry weather immediately after the hot months: plants which have been put out, are having a terribly rough time of it, and except that tea is flushing, all the usual work at this season might be said to be at a stand-still.

We will know 'All About Pepper' by and bye. Meanwhile some who have tried it, as an auxiliary to other things, are not so very enthusiastic as they were. A good healthy pepper vine is found to be more than a match for a sturdy jack, and seems to be capable of sucking the life out of it. In time the jack will show nought but bare poles after a struggle for existence, more or less prolonged. Some of us had not quite calculated on this masterful spirit on the part of the pepper and would have preferred to have seen a willingness to live and let live.

It becomes a question worth considering, if in a place where shade is needed, and pepper for a time may be successfully grown, it is wise to grow it and run the risk of having your needful shade killed out? Will the profit made by the pepper compensate? I don't pretend to be able to answer these questions; but there is no harm in asking them.

The under-current in favour of COFFEE still flows vigorously, and especially the one that makes for the Liberian variety. Every now and again you fall in with a man who has been agreeably surprised by what his Liberian coffee has done for him, and who is doing a little extending on the quiet. It wants so little culture, and can stand such an amount of hard usage, that Liberian coffee might have been expected to have been a favourite with the Sinhalese villagers. I fancy it is the trouble of planting which prevents its taking its place among the village favourites. If it had not had such an abominable bark-like pulp, very likely the monkeys would have proved useful, and gradually extended the cultivation! Coorg coffee too is being tried more extensively than it has been for some time, but what is it after all? Pretty much a kind of planting dilettanteism. A man gets over a bushel or two of seed, and a few acres are put in, but the full-hearted loyalty which was given to king coffee in the days of old, has died out.

Coorg coffee seed comes up well, and if all who have ordered this variety have had as excellent results, as I have seen in nurseries grown from seed procured from Mr. Hunt of Mercara, they must be fully satisfied. Every seed seemed to have germinated, and the plants were vigorous and strong.

By the way what there is remaining of Arabian coffee has been singularly free of leaf disease this year. Not that the old enemy is not about, it is still there, but the old force seems to be diminished. Perhaps the abnormal season we have been passing through may have something to do with it.

PEPPERCORN.

COCONUT PLANTING IN CHILAW DISTRICT.

SUSPENSION OF ST. ANNA'S FESTIVAL THIS YEAR RIGHTLY URGED IN VIEW OF PREVALENCE OF CHOLERA.

RAJAKADALUWA, CHILAW, July 1st.

The S.-W. monsoon has been almost a failure as regards rain, and while this is hard on vegetation (though our young trees are standing it remarkably well) the dry weather is all in favour of felling operations, which are pretty general throughout this part. Coolies are already talking of "St. Anna's" pilgrimage: surely Government will find it *convenient* to stop or restrict the festival for this year, on account of the fearful reports from Southern India. To have our labour enticed away at a busy time is bad enough, but of this we don't complain: the real grievance lies in the needless risk incurred of a general epidemic; and it seems almost miraculous that we have been so mercifully spared each year, so far. An outbreak of cholera would be but a poor commentary on physical cures said to be effected at St. Anna's shrine.—The coconuts hereabouts on the last clearing are giving great promise: they are better than any I have seen yet at that age.

INDIAN FISHES.*

[We have been meditating a notice of the book referred to in this review, but we feel we cannot do better for publishers or readers than quote the remarks of the writer in the '*Indian Agriculturist* —ED. *T. A.*]

A melancholy interest attaches to these volumes. When the Secretary of State for India determined to authorise the publication of a series of compendious handbooks on the vertebrate fauna of British India at a cost which should place them within the reach of all likely to be interested in such subjects, the fishes were committed, as a matter of course, to Dr. Francis Day, late Deputy Surgeon-General of Madras, the greatest living authority on the subject. He took up the work with characteristic enthusisam, but a life spent in brilliant and scantily recognised services to the cause of science was even then drawing near its close. In pain and weakness he laboured on, finished his manuscript, and corrected the proofs of the first volume. Then he was obliged to desist, and almost on the day when that volume issued from the press he passed away. The second volume was put through the press

* "The Fauna of British India, including Ceylon and Burmah," published under the authority of the Secretary of State for India in Council, edited by W. T. Blanford. "Fishes," by Francis Day, C.I.E., LL.D., &c., Deputy Surgeon-General, Madras Army (retired). Taylor and Francis, Red Lion Court, Fleet-street, London.

by the editor of the series, Mr. W. T. Blanford, who apologises for possible mistakes or omissions, but his name is a guarantee that the work has been as well done as it could be.

It would not be an easy task for us to criticise from a scientific standpoint, the work of one who was *facile princeps* in his subject, and happily it would be quite out of place to attempt such a thing in these columns. We have to consider the book from the point of view of those in this country who will make use of it, and if the number of Anglo-Indians who concern themselves about fishes (as distinguished from *fish*) is unfortunately very small, nothing is more likely to increase it than a clear well written manual, not too bulky to carry about, and not too costly to buy, which will enable any one, with a little trouble to indentify and name the most important or remarkable forms which may come under his observation. With such a help we venture to think that many will be tempted to take up a subject which in point of intrinsic interest is scarcely second to any. A visit to the neatly kept little collection in the rooms of the Bombay Natural History Society will convince any one that whether the cast of his mind inclines him to the beautiful, the strange or the grotesque, there is a boundless field of interest before him in the fishes of India. And if we turn from the æsthetic or curious to the purely utilitarian aspect of the subject, it must be admitted that the study of fishes is beyond all question of more importance to mankind than any other branch of natural history. It is difficult to realise the extent to which the people of this country depend upon the never-failing harvest of the sea. All down the coast of this Presidency where rice is the only grain in use, and beef involves damnation, and mutton can scarcely be had, all except the highest castes of natives subsist largely on fish. In Canara, even the Brahmins, though they may not willingly avow it, are well known to resort very freely to a diet which is almost the only alternative from rice *congee* and cocoanuts. Besides what is eaten in a fresh state, enormous quantities of fish are salted or sun-dried, or cured with salt-earth and exported to other parts of India or sent up the Ghants for consumption inland. Fish cured by simple exposure to the sun becomes, as most of us have had occasion to know, highly aromatic, and is much esteemed by the natives as combining the qualities of nutritious food and an appetising condiment.* Mahomedan sailors seem scarcely able to imagine that life can be sustained without it, and all who love to go a-sailing in Bombay harbour on a balmy summer evening soon learn to shun the leeward of the native anchorage at the time the *molles sabæi* of the Arab buggalows are preparing their evening meal. Along with the fish, which are dried for food, are vast quantities of very small fry, which are sold by the maund for manure. Then there is a considerable trade in the fins and tails of the shark-tribe, which yield gelatine, and are much prized by that eccentric epicure, John Chinaman. Finally, fish oil is manufactured on the coast more extensively than is generally known. There used to be a factory at Calicut for making oil from fish livers, which was under Government management. At this factory according to Dr. Day, no liver under 40 lb. weight was accepted, and he mentions one single liver which weighed 290 lb. Who can forbear to sympathise with that fish?

So far we have referred only to marine fisheries but every river in India, large or small, is incessantly worried with nets and weirs and traps, and here it is that the knowledge of the ichthyologist becomes of most value in detecting and devising means for counteracting the ruinous results of ignorant selfishness. For many of the fishes most valuable to man, like the salmon in Europe, spawn in fresh water and annually ascend rivers and streams for the purpose. In the sea they are only casually within the reach of man, but when they come into the rivers they are at his mercy, and he has none. He builds weirs and dams which render it impossible for any spawning fish to go up the water or else he contrives arrangements of nets which absolutely exterminate the fry as they come down. The wanton mischief done in these ways in India has been incalculable. The remedy is generally very simple when the habits of each species are properly understood. Weirs intended for purposes of irrigation can be rendered harmless by "fish ladders," which allow the fish to ascend at spawning time, and by forbidding the use of nets with meshes below a certain size, small fry, which are useless for food, can be saved and allowed to grow. It is possible, also, to do much good in a positive way by stocking waters with the most valuable kinds of fish, and taking measures, as far as possible, to exclude predaceous species. The attention of Government has lately been drawn to the matter, chiefly through the influence of men like Dr. Day and the well-known author of "The Rod in India"; but as far as this Presidency† is concerned, we do not know that anything has been done beyond "inviting opinions." At any rate, there is very much yet to do, and since accurate knowledge must be the basis of every successful measure, every Englishman in this country who turns his mind to the habits of its fishes may assure his conscience that he is serving his generation.

There remains the domestic side of the subject and this must not be passed over. We ought to know more than we do about the various kinds of fish which come to our table or which might come there. It is a sad fact, too characteristic of the Englishman in India, that of all the edible fishes to be had in the Bombay market there are only two for which we have yet

* A diet of such fish has been adduced as one of the chief causes of leprosy.—ED. *T. A.*

† Bengal.—ED. *T. A.*

HOW TO GAIN IN WEIGHT.

ALBUMEN (*i.e.*, materials like meat, gluten, casein, white of egg, &c.) is the food which makes flesh, and a certain amount of it is made up in the system every day, no matter whether any of it is taken or not, and no matter whether work is done or not. It seems, then, that albumen is most closely associated with the vital processes, and a man will die sooner when deprived of meat than of any other food.

Now, to increase the flesh a full supply of such food as meat, gluten, &c., is absolutely indispensable, and, if it be given with plenty of fat and starchy or saccharine food, will increase the weight. In low states of disease the most useful food is meat, but as the ordinary meat-teas do not contain the nutritious part of the flesh, zymine should be employed to digest out the insoluble ingredients.

A practical question is,—Why do people who are taking a goodly amount of cod liver oil grow thin? It is because they take too little meat. To do most good, oil should be combined with farinaceous food, as butter on bread. The endurance of fat-eating people is proverbial, and no other food will yield the force that fat will. Therefore it is that in wasting diseases recourse is had to cod liver oil. Because the oil has been given as a medicine it has oftener disagreed than it would otherwise have done.

The new form of cod liver oil may be counted among the more recent medical innovations. Formerly it was the custom among physicians to prescribe this oil in emulsions. These emulsions were manufactured with alkalies, which, with essential oils, made them soapy or heavy, and, therefore, bad for the stomach. Now it is the order of the day to give cod liver oil with a food, such as malt extract, and not with drugs. Consequently, a revolution has taken place in the dietetic treatment of consumption, scrofula, &c.

The initiative of all this was the discovery that cod liver oil could be dissolved in a good malt extract, and the Kepler Solution of Cod Liver Oil in Extract of Malt is now prescribed by physicians everywhere. It will fatten where cod liver oil would do no good, and where the person does not seem to be gaining so fast as is desired, see that plenty of meat is allowed, and success is morally certain; that is to say, there will be increase in flesh and fat, consequently, gain in weight.—"*Health*," London.

found names *viz.* the Pomflet and the Bombay Duck. There are a few more which the Boy introduces to us under such title as "Lady Fish" and "e-Slic Fish"; but he is, above all things conventional and tries nothing new. It will be in the memory of epicures that an enterprising secretary of the Bombay Club a few years ago introduced to the members of that institution a species of mackerel, which immediately rose into favour. It is one of the commonest fish on the west coast, but the club servants could scarcely be induced to bring it from the market. "It is not food for *sahebs*," they said. And how few of us suspect that a true sardine swarms on this coast, which according to Mr. W. F. Sinclair in a recent paper in the journal of the Bombay Natural History Society is far superior to the tinned article.*

These and many others we find in Dr. Day's book, with a passing comment on their edible qualities; but unfortunately the plan of the seriess necessitated so much compression, that miscellaneous matter had for the most part to be compressed out altogether. What was essential was a clear, concise, and yet complete description of every species, with such synopsis of families and genera as would enable the student to trace his specimen to its place in the system. This part of the work is done in a masterly way and illustrated by a very large number of beautifully executed drawings, which will aid the beginner more than anything else could have done. We regret to see that there is no attempt at any English index. Such a thing would have been very unscientific, but any book which appeals to the Anglo-Indian public, in its present state of advancement, must condescend to be unscientific. Anyone, however, who means to go into the subject even superficially will find it a profitable exercise to make his own English index, and also an index of native names for the district in which he resides. Our notion indeed of the best way to use a book of this kind is that it should be interleaved and converted into a note book for recording personal observations.

It only remains to say that the book is beautifully printed on good stout paper, and the binding is not showy, but substantial, and workmanlike, as befit a book which ought to be constantly under references.

JAVA PLANTING:

DISEASE IN SUGAR-CANE—COFFEE—RICE.

Consul McNeill reports as follows to the Marquis of Salisbury on the trade, commerce, and general matters relating to the Island of Java for the year 1889:—

EXPORTS.

SUGAR.—The past year has been quite an abnormal one, owing to the unprecedented continuance of the wet monsoon during the months of May, June and July which has exercised a very unfavourable influence on the outturn of the crop, and caused it to be a late one. The quality of the cane also suffered very considerably from the rains and from the "sereh" disease, which appears to be spreading in the eastward residencies, in spite of the planters' efforts to check it. The import of Borneo cane has not proved such a success as was anticipated and many planters are now contenting themselves with planting in the infected district sound cane procured from other parts of the island, where the disease has thus far not shown itself.

In the first months of the year it was expected that shipments would begin at an unusually early date; but owing to the inclemency of the weather at the commencement of the milling season, and the consequent delay in the grinding operations, deliveries were very late in arriving at coast stores and exporters who had concluded forward contracts for early shipment experienced great difficulty in carrying them out.

The past year's production, exclusive of molasses, amounted to 332,998 tons, as compared with 355,334 tons in 1838, and 375,784 tons in 1887, thus showing a decrease of 22,336 tons on last year.

The exports to various countries of the sugar-crops during the three years previous to 1889, exclusive of molasses, were as follows:—

	1886. tons.	1887. tons.	1888. tons.
Europe ...	242,359 ...	250,036 ...	175,141
Australia ...	13,486 ...	17,269 ...	26,175
China ...	59,944 ...	72,848 ...	85,148
America ...	5,657 ...	5,891 ...	39,208
Sundries ...	26,195 ...	11,073 ...	12,779
Total ...	346,641	357,117	338,451

Of the 1889 crop the following quantities in tons had been exported on December 31st last:—To Channel for orders, 62,996; to Port Said or Malta for orders, 84,180; to an Iberian port for orders, 3,468; to Marseilles, Genoa or Ancona, 10,072; to Australia, 20,208; to China, 31,210; to America, 22,980; to other ports, 7,169; total, 242,283.

The so-called "sereh" disease in the sugar-cane, which has appeared to such an alarming extent in Java since 1883, continues to be a source of much anxiety to planters. Commencing in the Cheribon residency, the disease gradually extended its ravages, proceeding eastwards, attacking the residencies of Tegal, Pekalong, Samarang, Solo and Djocdja. In 1889 it also made its appearance in a sporadic form in the east end of the island, in Madiven, Djombang, Modjokerto and Sidhoardjo, but in these districts the disease did not perceptibly affect the production of sugar

The disease manifests itself in the following manner, viz:—The joints of the cane remain very short growing much closer to one another than in the healthy plant; this causes the leaves to grow more closely together, thus presenting the appearance of a fan. The buds on each joint swell up and burst, forming new shoots, which in their turn produce others. Further, around the joints of the diseased canes fibres are frequently developed, similar to those at the root of the plant.

From the cane-shoot used for planting several canes spring up as in the healthy plant, and in the earlier stage of the disease one or two of these canes generally die off, whilst the remainder continue growing in the usual manner, and the presence of the disease is then only to be detected by the fibres growing around the joints, and by the swollen appearance of the buds; when the disease shows itself in a more palpable form the canes one by one stop growing, and remain poor and stunted; whilst in the worst stage of the disease the plant shows nothing but leaves, and the cane speedily dries up and dies. In the diseased plant the roots are invariably poorly developed, and harbour a parasite in the form of a microscopic worm (*Tylanchus sacchari* or *Heterodera radicicola*), the same worm which is found in the roots of many plants in Europe.

The opinions as to the origin of the disease are very conflicting, and even the most competent persons cannot agree on the subject. Of all the reasons assigned as being the cause of the disease, however, the following are the two most probable:—1, That the disease is of an infectious nature, and has its origin in bacteriæ. 2. That the disease is caused by the small worms which specially attack the weakest roots, work their way in, and thus prevent these organs performing their proper functions of giving life to the plant.

As regards this last opinion, should the question arise as to why these parasites did not appear in former years, or at least did not affect the roots as is at present the case, it is contended that probably the worms formerly existed in other plants, and gradually worked their way into the sugar cane, upon which they have thriven and multiplied, the canes offering a large field for their depredations.

The susceptibility of the canes for the operations of these parasites is attributable to the weak condition of the canes, which is ascribed to the planting and replanting of cane-shoots in the place of seed, coupled with a too intensive cultivation. Weakness owing to planting irrospective of sex has been frequently experienced, as, for instance, the poplar in Europe. As regards tho treatment of the disease, the supporters of

* The seir fish is common in the Calcutta as well as be Colombo market, and the sardines referred to bound in the seas around Ceylon.—ED. *T. A.*

the bacteriæ theory have attempted to destroy these insects by soaking the shoots in a solution of sulphate of copper or sublimate, which has so far met with little or no success.

On the other hand, the supporters of the worm theory have attempted to kill these parasites in the ground by means of sour sugar syrup, or the so-called Trisulfure de Carbone of Robart, which latter treatment has given so far hopes of good success. In the absence, however, of any actual remedy for the disease, large quantities of cane cuttings from healthy canes are imported from places where the disease has not made its appearance.

This measure is naturally a very costly one, and in the residency of Djockdjokarta alone fl.500,000 were spent in this manner in 1889; this is, in the meantime, the only course to be adopted, although it is now very difficult to find grounds which have shown no traces of the disease. In the last few years a large extent of grounds has been planted out in Borneo in the hope that this cane would prove impervious to the disease; but this hope proved illusory, as germs of the disease appeared on the freshly-improved cuttings, whilst cuttings obtained from this cane, after planting in Java, gave 50 per cent. diseased plants. Attempts to obtain healthy cane from the Straits were equally unsuccessful, as the "sereh" has also appeared there, whilst traces of other disease were also found in these canes, and imports from this district were accordingly strongly discouraged. At present planters are growing canes in the hilly districts of Java in order to get cuttings, and the results obtained from this cane are encouraging.

Should bacteriæ, however, be the cause of the disease, it is feared that no remedy will be found, and that the disease will have to run its course just as any other epidemic, until it gradually dies out and disappears. If, on the other hand, it is caused by the presence of the worm in the roots, the experiments already made go to show that there is some hope of successfully combating the disease. At present it may be said that the disease is decreasing in the districts where it first made its appearance, of which proof is given by the increased sugar production in the westward districts.

In the latter half of January a meeting of planters and merchants interested in the sugar industry was held at Samarang in order to frame measures to be taken against the "sereh" disease, and to discuss matters of general interest. This Congress afforded planters an opportunity of exchanging their views, but so far no unanimous course of action has been resolved on. A plan was formed to obtain the services of a specialist from Europe to investigate the causes and means of combating the "sereh" disease, but owing to the necessary funds not being forthcoming it proved impracticable to carry out this project.

COFFEE.—The leaf disease, referred to in my previous reports, continues to prevail in middle Java. More encouraging reports are circulated regarding the course run by the disease in the east end of the island, where it is averred that, except in a few of the old low-lying plantations, the disease has disappeared. The Government crop amounted to 583,458, against 564,586 piculs in 1888, and 254,058 piculs in 1887. Heavy rains and strong winds have caused much damage to the coming crop, which it is estimated will not exceed 400,000 piculs Government and private together, and in some quarters it is doubted whether this figure will even be reached.

RICE.—Want of rain in the beginning of the year seriously interfered with sowing, and affected the outturn of the crop. At one moment fears of a famine in some districts were entertained, and several small lots of foreign rice were imported by Chinese firms. Prices ruled high during the year. Prospects for the coming crops are favourable.

TOBACCO CROP has been a full one, especially as regards scrubs, for which description higher prices have been obtained than usual.

COPRA.—The development in the production of this article had the effect of driving up the price of coconut oil, as a result of which less copra was brought to market.

COCOA has been planted on a small scale in some of the mountain districts, and the yield of the trees, though small, was satisfactory as regards quality. The plantations are being extended in Middle Java, but it is still doubtful whether the cultivation will assume large proportions, as the plant only thrives on a very few estates. 135 bales, weight unknown, were shipped from Sourabaya, and nearly 40 tons found their way to Samarang, of which about 4 tons found their way to Singapore, and the balance shipped to Holland. The export from this port was unimportant.

CINCHONA.—An increase of 642 tons in the exports of this article can be reported, the figures being for 1888 1,990 tons, for 1889 2,632 tons. Owing to low prices ruling at home results have not been satisfactory.—*L. and C. Express.*

A GRAND MANGO SEASON.

It is a wonderful season for mangoes. They were selling at Galagedara the other day at eight cents a hundred, and of a good edible kind, and later on when they were said to be going out, I bought them at Teldeniya at 12½ cents the hundred. The natives usually couple a good fruit with a sickly season, and it is true in the present year but strange to say the sickness preceded the coming in of the fruit.—*Cor.*

REMARKS ON THE STATE OF BOTANY IN CEYLON.

WITH REFERENCE TO THE KNOWLEDGE OF IT IN APRIL 1843, AND AN ATTEMPT AT ARRANGING ITS FLORA AS KNOWN TO MOON AND RESIDENT BOTANISTS ACCORDING TO LOCALITY AND ELEVATION, COMMONLY CALLED GEOGRAPHICAL DISTRIBUTION OF A FLORA.

BY CAPTAIN CHAMPION, 95TH REGT.

GEOGRAPHICAL DIVISION OF PLANTS IN CEYLON.

(*Continued from page 61.*)

From this Table 2, it will be seen that various fruit trees of the tropics thrive on the coast which are less abundant or altogether disappear in the Kandyan Country. The Palm trees are also for the most part different. Cocoanuts thrive in the greatest perfection and become the leading feature of the Coast: sufficiently numerous to form topes: there are a considerable variety of the Coconut-palm—they have been mentioned by Bennett and other writers. The features of the jungle present but little change for the extent of table land running sixteen miles into the interior, when the country changes and becomes hilly and we are gradually brought into scenery the component parts of which are mentioned in Table 3. It seems to be similar in its Flora to that of the Circar Hills in India—Of indigenous fruits of any value, there are few; but the fruits of China and the Archipelago and many vegetables are cultivated with success. The stranger will be struck with the Talipot tree and want of the Coconut, except near villages and also with the Aleurites or Kækuna, the foliage of which has the peculiarity of appearing white after rain amongst other jungle trees. Its nut is much used for expressing lamp oil by the natives. Two species of Bramble will also be hailed as an approach to a colder climate, most of the plants and trees in this table will be found on the under features of the hills on the banks of the Mahavilla-ganga, whilst on approaching the higher hills, some of which are mountains 4000 to 5000 feet above the level of the sea, we come to a forest vegetation, the details of which are in Table 4. Trees are no longer in those heights festooned by Convolvuli and Ipomœas and Lorantie are less numerous; but their place is supplied by many a lovely air plants and the mag-

nificent Solandra oppositifolia. On the summits of these hills are found beautiful and rare plants—Begonias, Martyniae, Didymocarpus, Aginetia, Acrotræma, delight in the cold and shady precipices. The Betle-Palm is here exchanged for a Caryota bristling with thorns. On reference to a map it will be observed that the ridge of hills, between Kandy and Gampola extends towards Rambodda so that most of the vegetation passed in travelling to Rambodda may be observed in a couple of hours' walk from Kandy to the top of its highest hills, which have nearly an elevation equal to that of Rambodda. Table 9 will however add a few other particulars, and leaves us now to comment upon the colder portions of the Island or its highest mountains, in which examples are given of the Nuwera-Ellia Flora in Table 6 and the Flora of Adam's Peak in Table 7.

The Nuwera-Ellia country is a series of small plains, surrounded by hills and mountains thickly clothed with jungle to the very eummit. Its elevation above the level of the sea is about 6000 feet. Its highest mountain—the Pedro-talle-galla, rises to 8000 feet. Its soil is very black and turfy in the plain, being either marshy or reclaimed marsh—The slopes of the hills turn into meadow land. Before reaching the jungle, a curiously disposed and natural hedge of shrubs intervenes—it extends with great regularity, and is a very peculiar feature in the country. It were erroneous to suppose that either the climate or productions of Nuwera-Ellia are European—but it is our alpine tract and in losing the Palm, the Cinnamon and a thousand of the ornamental trees and shrubs of the Coast, we forget the tropics. In Europe, the gradations of Winter and Summer have a most powerful effect on the system of all perennials. In Winter the leaves fall —the tree is denuded of all its ornaments. In the mass of vegetation, the sap refuses to flow until the genial return of spring: the woody tissues harden and give rise to those concentric rings or zones, by which the Carpenter can calculate the age of his timber. But as Summer advances, the sap returning induces a fresh growth and the formation of flowers and fruit—The absence of a well defined winter is therefore the great difference between Nuwera-Ellia, and our native land, and a simple answer to the query, Why do not the large Cherry trees of its gardens produce fruit? In vain do we look for a single tree (unless introduced) of genera indigenous to our English climate: the trees, although not those of the Coast, are still those of the tropics—they are however of hardier growth, usually evergreen and adapted to our Alpine region, where frost excludes delicate species and the sun rarely shines except during the earlier months of the year. Analogy from such inferences leads us to expect the annuals of our Summer which die during the Winter season and the plants of our marshes, and accordingly I have to mention genera familiar to the British Botanist intermixed with Alpine Indian Plants. The sweet little Hairbell is perhaps as grateful to us from association as the curling smoke of cottages rising over the jungle. The European genera are Andromeda, Vaccinium, Ranunculus, Thalictrum, Anemone, Viola, Rubus, Frograria, Berberis, Scutellaria, Lysimachia, Polygonatum, Plantago, Lobelia, Cynoglossum, Alchemillea, Rhododendron, Magnolia, Potentilla, Hypericum, Impatiens, Monotropa, Neottia, Orchids, Drosera, Dipsacus, Valleriana, Utricularia, Campanula, Tradescantia, Oxalis, Polygala, Gnaphalium, Rhinanthus, Euphorbia and some others—most of which have species growing in Great Britain. The character is scarcely Hymelayan, but I am inclined to believe that its Flora accords so closely to the tract of land on the Neilgherries that three-fourths of either would contain the same species. We have not their rose it is true, which is described as very beautiful festooning trees, but in either the Rhododendron nobile forms the ornament of the plains. From the elevated portions of Java there seems to be a marked difference in the absence of Oaks and Chestnuts and of course of various other productions.

The Plains of Nuwera-Ellia are very destitute of trees with exception of the Rhododendron. It is very beautiful when it flowers from May to July—the scarlet blossoms are relieved by the brown inside the bell of the Corolla and by the silvery undersides of the stem leaves—at other seasons it is a dingy tree like the Apple in height, with crooked knotted trunk, varying from 10 to 15 feet or even 25 and 30. When Arboreta shall have been introduced and Villas in Nuwera-Ellia, we may expect gardeners to give us many pretty shrub varieties of this tree with English species. Lord Carnarvon gained a celebrated Mule species by fertilising R. Cataubriense with the Himalayan sp. R. Arboreum. It retained the flowers and color of R. Arboreum and had the leaves and hardiness of constitution of R. Cataubriense.

I have already remarked that S. American species of plants became naturalised with great facility in the lower tracts of Ceylon—such is the case at Nuwera-Ellia with the productions of New Holland. and almost all the other trees of its plains have been introduced from that country by Europeans. Of the jungle trees, scarcely any thing is as yet known, but some are doubtless those of the Kandyan hills, and of the rest a few, and these good ones have been discovered. I was fortunate in finding an arboraceous vaccinium—a sp. of agapetes with pink flowers. A description of the genus will be found in a letter from Dr. Wight to Sir W. Hooker, dated Pulney mountains. There is a beautiful tree creeper belonging to the Melastomaceæ, possibly a Medinilla, Blume;* the balsams of those hills are certainly of 8 or 9 different species. some are of great beauty and size, and one species forms the entire under shrubbery of many hills, as well as the Nilla, which is a didynamious plant. Air-plants and magnificent ferns abound and dwarf bamboos—on the rocks, mosses and from the trees white mosses drenching in the drifting storms add to the wintry aspect. The Kino tree, both red and white, is much used for firewood. I am not acquainted with its botanical name.

Europeans have cultivated several of our English vegetables with success, most however requiring to be renewed from England or the Cape after some years. Potatoes and Cabbages are really source of profit and of importance to the residents of the lower orders. The Cape Gooseberry (now naturalised) makes an excellent tart fruit with the wild Bramble. English fruit trees probably require great care and particular mode of culture to produce fruit, hitherto retardation of the sap has not been attempted, or if so successfully practised, but it seems to be the key to success. They should try fruit trees from New Holland and New South Wales and the Raspberry and Gooseberry from England.

Mr. Stewart Mackenzie judiciously tried the introduction of the Tea plant, I have not heard with what success, or what steps had been taken to insure the climate and locality it is used to.

From a perusal of Mr. Robinson's account of the Tea plant in Assam, the plant appears to be of hardy character with respect to climate. I am inclined to believe that that of the Kandyan hills would be very suitable, having very much the Assam style of vegetation—possibly better than Nuwera-

* The blaze of rose-coloured flowers on this creeper which always runs up a tree-trunk, forms one of the most beautiful sights in our Ceylon jungles. —Ed. *T. A.*

Ellia. The great difficulty however exists in a locality. The requisites are excess of humidity amidst forests of dense jungle, where it grows in ravines and hollows near rivulets or pools of water. The soil should be light and porous, yellow or yellowish red over sand: it contains no carbonate of lime and the iron of the soil is almost wholly in a state of carbonate of iron—hence even in Assam and China tea-soils are comparatively of rare occurrence. The plant requires much rain and a bright sun.

I am not aware that Hops have ever been attempted to be introduced at Nuwera Ellia, they surely would succeed. As the neighbourhood is becoming more populous, possibly a Brewery might succeed.

That the grasses at Nuwera Ellia are of very inferior quality seems notorious—but surely are capable of great improvement. Were their quality good, the country is well adapted for pasturage—Cattle and Horses have great animal spirits, and there are no leeches. Vetches of different kinds are also appropriate to the climate.

The Flora of Adam's Peak is probably entirely similar to that of Nuwera Ellia—but not having level ground near the summit of the Peak, many of the meadow flowers have to be excluded, and possibly there are species which do not exist in the Nuwera Ellia country, for instance a new Monocera or Elæocarpus with purple fruit and entire leaves. The existence of species of Magnolia is an interesting feature. It however is probable that all the Indian Magnolias should be classed with Michelia. The existing sp. (two in number on the Peak) have the type of Magnolia punilla.

It was my intention to have added a list of descriptions of Rare Plants not named by Moon, but those daily increasing, I shall reserve them for some future opportunity, when our knowledge of what has been done by Indian Botanists is greater, which will prevent the confusion that might otherwise exist.

In conclusion, one word respecting the Government gardens. Let bye-gones be bye gones, as is said in the North. Little undoubtedly has hitherto been done, and some of the leading requisites have been neglected and the Gardens require great attention and severe application from its new Superintendent to place them on the footing they ought to hold—but thanks to the liberality of our present Government, the aspect is beginning to change, and *order* will soon rubbish out the many rare plants and trees which are at present unnamed, and consequently unknown both in the gardens and in the beautiful series of drawings which have been amassed from time to time without name. Let us therefore hope to see Peradenia re-established as Kew has been in the—40's, and a taste for Botany revive in the Island, and when our Indian friends find we are really in earnest—they will not be backward in imparting to us the many treasures yearly added to their own gardens, and in shewing us how many neglected resources of wealth or utility exist in what is at present,—Unreclaimed Jungle *Kandy, May 29th* 1843.

TABLE 1st.

GENERAL FEATURES OF CEYLON VEGETATION.

Plants which being common or growing in masses form the general character of vegetation; from the Coast to an elevation of 2,000 to 3,000 feet above the evel of the sea.

General temperature 70° to 80° Faht.

1. Predominating Tree like Plants.

Dillenia Speciosa, Aquatica & Sp. Annonacæ Sp. Terminalia Catappa and Sp. Memycylon ramiflorum and Sp. Psidium pomiferum, Syzygium caryophyllum, Eugenia Sp. Jambosa vulgaris and Malaccensis, Calophyllum Inophyllum, Sterculia Balanghas, Bombax Malabarica, Eriodendron anfractuosum, Pterospermum subetifolium, Thespesia populnea, Elæocarpus serratus, Grewia Sp. Citrus decumana, Limonia arborea and Sp. Glycosmis Sp. and others, Aurantiaceæ, Croton Moluccanum, Euphorbia antiquorum, Erythrina Indica, Cæsalpinia Sappan, Poinciana Pulcherrima, Moringa Pterygosperma, Bauhinia tomentosa, Semecarpus Anacardium, Anacardium occidentale, Mangifera Indica, Morus Indica, Ficus, glomerata, Religiosa, Indica, Elastica and others, Celtis orientalis, Artocarpus integrifolius, Incisa, Pubescens, Cassia Sp. Hernandia sonora. Cinnamonum Sp. Morinda citrifolia, Clerodendron infortunatum, Callicarpa lanata, Vitex trifolia, Negundo and Sp. Tectona grandis, Tabernæmontana dichotoma, Plumeria acuminata, Borassus flabelliformis, Areca Catechu, Caryota urens, Cocos nucifera, Musa Sp. Pandanus odoratissimus and Sp. Bignonia Sp. Meliaceæ, Metroxylon Sagus, Carica Papaya, Bambusa arundinacea, Tamarindus Indicus, Ricinus communis, Bixa orellana, Spathodea Indica.

2. Predominating Shrubs and Plants.

Cissus and Vitis Sp. Osbeckia Zeylanica and Sp. Mukia scabrella, Coccinia Indica, Langenaria vulgaris and other Cucurbitaceæ Modecca palmata, Passiflora fœtida, Cardiospermum Helicacabum, Schmidelia Cobbè, Hibiscus Surattensis, Urena lobata, Abutilon Sp. Sida Sp. and other Malvaceæ, Triumfetta angulata and annua, Ammannia octandra and Indica, Zizyphus Ænoplia and Sp. Phyllanthus Niruri, Urinaria, Emblica, Croton lacciferum and Sp. Jatropha Curcas, Euphorbia Sp. Portulaca, Mulluga Sp. Toddalia aculeata, Impatiens Sp. Crotalaria Verrucosa, Laburnifolia and Sp. Indigofera Sp. Tephrosia purpurea and Sp. Desmodium triquetrum, Polycarpaea and Sp. Abrus precatorius, Flemingia strobilifera, Phaseolus Sp. Acacia Sp. Guilandina Bonduc, Cassia occidentalis, Tora and Sp. Bohmæria Alientata, Piper Sp. Cansiera Scandens, Aristolochia Indica, Amaranthaceæ, Menispermaceæ, Ipomæa Zeylanica and Sp. Mussænda frondosa, Hedyotis Sp. Ixora coccinea, Pavetta Indica, Elephantopus scaber, Vernonia zeylanica cinerea, Psiadia balsamica, Bidens Chinensis Ocimum Sp. Leucas zeylanica, Indica, Stachytarpheta Indica, Lantana Sp. Barleria Prionitis, Justicia adhatoda, Gendarussa, Ecbolium, Betonica and Sp. Gratiola Sp. Datura Metel, Capsicum annuum, Minimum, Solanum Indicum, Nigrum, Jacquini Carisa Sp. Asclepias Curassavica, Calatropis gigantea, Hemidesmus Indicus, Zingiber Sp. Alpinia Cardamomum, Costus speciosus, Canna Indica, Gloriosa Superba, Tradescantia cristata, Axillaris, Dioscorea alata and Sp. Arum, Caladium, Sp. Pothos scandens, Cyperaceæ and Glumosæ, many Sp. Tragia Chamælea, Lycopodiæ and Filices many Sp.

On Trees, Loranthus many Sp. Epiphytal Orchideæ.

In Marshes and Ponds.

Pontederia Sp. Nymphæe Sp. Nelumbium speciosum, Justicia Sp. Hydrolea zeylanica, Exacum zeylanicum, Villarsia cristata and Sp. Convolvulus reptans, Eriocaulon Sp. Gratiola Sp. Torenia Sp. Diceros Sp. and others.

TABLE 2nd.

General features of the Flora of the Sea Coast near Colombo; elevation level of the Sea to 500 feet.

Ther. 80° to 86 Faht.

All the trees and plants of Table 1st, large topes of the Cocoa Palm add.

1. On the Sea Shore.

Argemone Mexicana, Heritiera littoralis, Convolvulus Pes Capræ,* Bignonia salina, Rhizophora can-

* This is the "goat's foot ipomea," which in the north-east monsoon months is covered with beautiful purple-red bells. Tennent, on his arrival at Colombo, found

delaria, Kandelia Rheedii, Bruguiera gymnorhiza, Calanehoe laeiniata, Dilivaria ilicifolia.

2. Marshes, Ponds, Meadows.

Burmannia disticha, Nepenthes Sp. Pontederia hastata, Xyris Indica, Cuscuta reflexa, Justicia repens Tenella, Ereeta, Lumnitzera racemosa, Drosera Burmanni, Utrieularia vulgaris, Cærulea, Menyanthes Indica, Nymphæa stellata, pubeseens, Peda lium murex, Pancratium zeylanicum, Serpieula vertieillata, Tyha latifolia, Lemna minor, Pistia stratiotes, Potamogeton lateralis.

3. Tree like Plants.

Cassia auriculata, Sumatrana, Glauca, Melastoma Malabathriea, Sesbania aeuleata, Flaeourtia inermis, Calophyllum Calaba, Sehleiehera trijuga, Barringtonia speciosa, Acutangula, Raeemosa, Melia Azederaeh, Limonia citrifolia, Feronia Elephantum, Ægle marmelos, Strychnos nuxvomica, Guatteria suberosa, Korinti, Grewia orientalis, Hippoeratea India, Dalbergia arborea, Aeacia odoratissima, Cæsalpinia Mimusoides, Ardisia solanacea, Mimusops Elengi, Kauki, Bsssi longifolia, Spathodea longiflora, Uvaria Narum, Eugenia parviflora, Averrhoa Carambola, Bilimbi, Cinnamonum Zeylanicum, Aromatieum, Annona squamosa, Nauclea Sp. Randia Sp. Phœnix farinifera, Caryota urens, Elate sylvestris, Cerbera manghas, Iehnocarpus Sp.

3. Shrubs and Plants.

Vinca rosea, Osbeekia aspera, Cissus villosa, Vitis latifolia, Repanda, Quadrangularis, Alysiearpus Sp. Nerium zeylanicum, Carissa spinarum, Olax zeylaniea, Capparis horrida, Hibiscus cannabinus, Viti-folius, Phyllanthus rhamnoides, Multiflorus, Flemingia lineata, Glyeine labialis, Parviflora, Dicerma pulehellum, Adananthera pavonina, Connarus monoearpus, Pinnatus, Rourea santaloides, Ixora latifolia, Parviflora, Ionidum enneaspermum, Bengonia tenera, Hugonia mystax, Indigofera viseosa, Enneaphylla, Aspalathoides, Canthium Rheedii, Gmelina asiatiea, Heliotropium Indicum, Clerodendron phlomoides, Inerme, Premna Sp. Solanum insanum, Ferox, Sodomeum, Epaltes divarieata, Eclipta ereeta, Gynura lyeopersieifolia, Loranthus lonieeroides, Trichosanthes cueumerina, Bryonia, grandis, Momordica charantia, Antidesma Sp. Phaseolus earacalla, Trilobus, Sadiatus, Celastrus emarginatus, Abelmosehus ficulneus, Moschatus, Melastoma repens, Bumelia oetandra, Embryopteris glutinifera, Evolvulus Sp. Seævola Taeeada, Kœnigii, Sesamum Indicum, Ruellia Sp. temodia camphorata, Buehnera Sp. Hoya Sp.

Table 3rd.

Flora of the lower tracts of country surrounding Kandy 50 to 70 miles from the Coast, Elevation 1000 to 2000 feet.

Ther. 70° to 80° Faht.

All the trees and plants of Table 1st. The Cocoa Palm gives place to the Tallipot, Palmyra, and Areca Palms—add:

1st Tree like Plants.

Michelia Champaca, Uvaria odorata, Annona reticulata, Leea staphylea, Cupania eaneseens, Grewia, lævigata, Mieroeos Sp. Melia parviflora, Atalantia monophylla, Murraya exotiea, Bergera Kœnigii, Aleurites moluecanus, Hiptage madablota, Gomphia angustifolia, Sesbania Ægyptiaea, Agati grandiflora, Erythrina pieta, Pongamia Sp. Dalbergia Anstrutheri (Mr. Ondaatje) Cassia Florida, Roxburghii, Bauhinia racemosa, Fieus politoria, Trophis aspera, Spinosa, Hydnoearpus inebrians, Mesua ferrea, Lagerstrœmia Reginæ, Stilago diandra, Clerodendron maerophyllum, Helicteres Isora, Alangium hexapetalum, Eugenia laurina, Gareinia zeylanica, Elæodendron glaueum, Dodonæa Burmanniana, Diospyros Ebenaster, Cordifolia, Flaeourtia sepiaria and Sp. Semeearpus Anaeardium, Cinnamomum Cassia, Antidesma sylvestris, Willd. Clauseneæ 2 Sp. Amyris agallocha.

2nd Shrubs and Plants.

Paratropia venulosa, Hedera terebinthiaeea, Cissus dentata, Osbeekia crenata, (Moon) Loranthus Buddleioides, Longiflorus, Goodenciflorus, euneatus, Æehmandra rostrata, Bryonia laeiniosa, Gymnopetalum Ceylanicum, Momordiea dioiea, Passiflora Leschenaultii, Naravelia zeylaniea, Ribes serratum (Moon) Capparis Grandis, Hibiseus furcatus, Abutilon periplocifolium, Gossipium album, Euphorbia tirucalli, & Sp. Rubus rugosus, Lasioearpus, Vernonia anthelmintica. Indigofera atropurpurea, Æschynomene aspera, Smithia sensitiva, Desmodium congestum, Psophocarpus tetragonolobus, Canavalia virosa, Mueuna prurita, Galactia tenuiflora, Notonia Wightii, Crotalaria Brownei, Hirsuta, Mimosa rubicaulis, Cæsalpinia sepiaria, Cassia Kleinii, Bryophyllum calyeinum, Polygonum Sp. Convolvulus grandiflorus, Speeiosus, Randia dumetornm, Hydrophylax maritima, Styleeoryne, Webera, Phyllantbus myrtifolius, Chrysanthemum Indieum, Siegesbeckia Orientalis, Pluehea tomentosa, Sphæranthus hirtus, Anisomeles Malabaricus, Caladium Nymphæifolium, Jussiæa villosa and Sp. Triehodesma zeylaniea, Cynoglossum ovatum, Solanum pseudo Lycopersieum, Ceropegia acuminata and Sp. Gymnema tingens, Jasminum pubeseens, Hedyehium coronarium, Alpinia calearata, Phrynium eapitatum, Amomum eehinatum, Amaryllis, zeylanica, Polygala Sp. Canthium parviflorum, Thunbergia fragrans, Barleria longifolia, Eranthemum montanum, Utrieularia Sp. Morinda umbellata, Ixora stricta, (wh. fld.) Ophiorrhiza Munghos, Ophioxylum serpentinum, Grumilea subinteger, Alsine nervosum, Ultica several Sp. Musa Troglodytarum, Santalum album, Gardenia fragrans, Anthericnm tuberosum, Burmannia triflora, Dieeros aquaticus var, Ventilago maderaspatana, Acacia scandens.

(To be continued.)

the Galle Face ablaze with the blossoms. It was properly cleared away from the esplanade, but poor Wm. Ferguson, when living, cultivated and protected this binding plant on the seashore sands opposite the Galle Face walk. To the disgrace of the Municipal authorities they are now allowing the plant to be exterminated and the sands left bare to the action of the waves. In our drives we constantly see men and boys not only tearing the plant up but rooting it out with their dagger-like knives. It is taken away as food for rabbits and goats.—Ed. *T. A.*

Mysore Coffee Planters' Grievances.—The agitation of the coffee planters in Mysore is at last likely to bear fruit. It will be remembered that the planters complained year after year that the working of the Breaeh of Contraet Act was very defective and involved them in much loss. The Mysore Durbar have now partially redressed this long-standing grievance. It has been laid down that all *maestries* who take advances from the eoffee planters and, in consideration of these, undertake to provide them with *coolies*, should register their names in the taluq cutchery and no one will be allowed to pursue the trade of a *maestrie* unless so registered. The effeet of this ruling will be that the planters will be saved from the trouble of instituting inquiries in eaeh case as to the antecedents of *maestries* who volunteered to provide coolies, and erring *maestries* can also be easily called to account in case of default.—*Cor.*, *Madras Times*, July 3,

CEYLON TEA IN LEAD PACKETS—TEA AND THE HOME DUTY—AERATED TEA.

London, June 20th.

The following letter, which appeared in the *Grocer* for last week, shows how little the retail traders who deal in your teas have done to make themselves acquainted with the terms and conditions of the Merchandise Marks Act. It seems impossible to believe that any man, knowing how readily the provisions of that act may be transgressed and of the liabilities he may himself incur, should fail to carefully read it and guard himself in accordance with what he may find in it. And yet this "country grocer" seems to have got hopelessly muddled over the reports of the recent Segama case, and never to have thought of examining the act itself to find a solution to his difficulty. Mr. Leake, as Secretary to the Association, has this week sent a letter to the above-mentioned paper which will doubtless resolve the doubts of its not very bright correspondent, and it will prove to that individual that, provided he can prove innocence as to all intentional deception, and *bona fide* belief on his own part as to the genuineness of the teas he sells, he will be held scatheless under the provisions of the act. The following is the text of the letter referred to:—

Ceylon Tea in Lead Packets.

Sir,—Like many other grocers, I have undertaken the sale of the above, packed and labelled with high-sounding titles by well-known London dealers. I am pestered with appeals to take up other brands of the same class. These teas are variously described as "pure Ceylon," "Ceylon blends," "guaranteed three-fourths pure Ceylon," "a blend of Ceylon and other choice growths," &c.

But some recent proceedings in the law courts, reported in your columns, have awakened in my mind and, as I happen to be aware, in the minds of many other retailers, apprehensions which may be exaggerated or perhaps entirely unfounded. Suppose the Ceylon Tea Planters' Association—always on the alert to protect their interests and to pounce on the unscrupulous, the fraudulent, the mendacious, or the unwary vendor of tea—should take me before the magistrate on a charge of selling tea bearing a false trade description, could I be called upon to prove that the incriminated packets contained pure Ceylon or that there was, at any rate, some Ceylon tea in them?

No doubt I should be able to get half a dozen experts to swear that my tea was "pure Ceylon," or "three-fourths Ceylon," or whatever the exigencies of my case demanded and it is equally without doubt that the Ceylon Tea Planters' Association would be able to produce an equal number of duly qualified judges prepared to swear that my packets did not contain a leaf or a particle of Ceylon tea. The wholesale dealer from whom I bought the tea might then be called, and he being a man of mysteries, would reply that he was not prepared to divulge trade secrets, &c.

The point to which I would direct your attention, and upon which I hope to elicit practical trade opinion, is thus:—Whether misdescripton—even if purchasers are not misled by it—as to quality and place of origin, without the assumption of the name or brand of any particular estate, is actionable and punishable?—I am, &c., A Country Grocer.

June 11th.

The leading men in the tea trade seem to think that there are at last some indications as to how the different tea-growing countries are likely to be affected by the late reduction by twopence of the tea duty. Few of us had thought it possible that these could be furnished within so short a time, but it is evident that—whether due to the reduction or not—there has been a manifest change in the relative position of the various teas within the last fortnight or so, and it may be that experts have been right in the conclusions they have drawn from it. If these are correct, the view taken by myself and many others, that the reduction would prove to be favourable to China rather than to Ceylon or Indian teas, was a wrong one. This is what Messrs. W. J. & H. Thompson have written recently on this topic:—

"The probable effect of the reduced duty on values has been much discussed. Judging from the active demand, coincident with the reduction, and the advance in prices, the result has been favourable to the best teas, *i.e.*, to India and Ceylon, not to China. This tends to confirm the opinion held by some who are in close touch with consumers, that the public may take advantage of reduced retail prices to buy better tea; which agrees with our observation, often recorded, that tea-drinkers are learning to appreciate the benefit of using good qualities."

We hardly think, however, that you would do wisely to rely too unreservedly on this expression of opinion, though it has the *imprimatur* of such high experts as Messrs. Thompson. So many circumstances may contribute towards a disturbance for a time of the balance of the tea trade, that it is rather optimist perhaps to found a decision without awaiting the result to a more lengthened experience than has as yet been available since the duty was reduced. The mere fact of that reduction alone can hardly be held to account for the late boom in Ceylon teas, which have gone up fully twopence the pound during the last fortnight or three weeks.

My last letter made reference to the new drink prepared from your staple production and which we hear is called Aerated Tea, and not Sparkling Tea as previously mentioned by me. During the week opportunity occurred for me to taste this new drink, and my verdict upon it is decidedly very favourable. It opened as briskly as any champagne could do, and presented in the glass the appearance of the finest and clearest Alton ale—the aroma of the tea was quite perceptible to the nose, and equally apparent to the palate on drinking, It had something of the flavour of a raspberry sherbet, but without the cloying taste that beverage possesses. An old Etonian told me that, were his cricketing days to come over again, he could desire no more refreshing drink, it being in his opinion quite as staying, and infinitely more palatable, than the cold tea he always used to drink when playing. It is probable that it may be manufactured cheaply enough to warrant its being retailed at twopence the bottle; and should this be accomplished, we really believe it will run other temperance drinks very hard as a competitor in public favour and so conduce largely to the wider consumption of teas. We are assured that to obtain the delicacy of flavour so much appreciated by those who have as yet tasted the new drink it is necessary to use teas of the higher grades only. The commoner sorts would impart a roughness which would be much disliked. Mr. Wrightson, the patentee, gave me several particulars respecting his endeavours to produce this beverage which were of interest. He told me that former attempts made in the same direction have failed, as tea in solution is a very difficult article to guard against turbidity and requires most careful manipulation. He and the chemist who has been assisting him have been engaged on the required experiments for some years, and they believe they have now achieved complete success, and that the drink can be kept sweet and clear for almost an unlimited time. They are sending samples to the

principal doctors and analysts for report, and expect their full support, I am assured that "aerated tea" is made out of *pure tea*, no chemical essences or flavouring being used in its manufacture. By a novel process, an extract (which is also patented) is obtained, and from this—which will keep bright indefinitely by a preservative which is also a sweetener—the aerated liquor is finally prepared. It is entirely non-alcoholic. Mr. Wrightson further informed me that it is in contemplation to at once start a syndicate with a capital sufficient to thoroughly advertise the drink all over the country and then to sell to a larger company the patents obtained whenever it is thought desirable to acquire them. The patentees are now in treaty with certain moneyed parties, and have reserved the right to offer £1,000 of the capital to members of the Stanley-Wrightson Syndicate which manufactures the new tea chests. I think most certainly that the drink may become very popular, and that it is therefore likely to aid materially in the sale of tea both in this country and in those wherein cooling drinks are even more in demand than they are among ourselves.—*London Cor.*

JAVA COFFEE.

In view of the unfavourable accounts received recently concerning coffee production in Java a report on the subject to the Turkish Minister for Foreign Affairs at Constantinople by M. Werdmüller d'Elgg, a Dutch resident at Passeroean (Java), is of special interest. He deals with the production of coffee in Java during the last 30 years, and transmits with his report a note on the *Hemileia vastatrix*, the phylloxera of the coffee shrub, which has caused and is causing such great damage in the Indies. The *Board of Trade Journal* says that, according to the documents furnished by M. d'Elgg, the average production, in piculs, of coffee in the 19 residencies of Java has been, for periods of five years, as follows:—893,400 piculs in 1859 63; 797,000 piculs in 1864-68; 831 000 piculs in 1869-73; 899,000 piculs in 1874-78; 988,000 piculs in 1879-83; 635,000 piculs in 1884-88.

It will be seen that production has been very irregular during this period of 30 years; but until the 1884-88 period it was to be attributed to the ravages of the *Hemileia vastatrix*, the presence of which has been officially noted in Ceylon since the year 1869, but which has only penetrated to the heart of the plantations of Java towards the year 1884. In fact the three residencies which have most suffered from the insect are those of Semarang, Cheribon and Madioen, which, having produced on an average during the 1864-68 period: the first 52,700 piculs; the second, 24,900 piculs; the third, 60,300 piculs; have produced during the 1884-88 period, no more than 27 300 piculs, 11,760 piculs, and 33,275 piculs, so that the average production of these three residencies has diminished by 50 per cent. for that of Cheribon, 53 per cent. for that of Madioen and 54 per cent for that of Semarang.

M. d'Elgg adds that it has been found from researches and experiments that in Java, where coffee has been cultivated for 200 years, there is littled ground for supposing that the cause of the decadence of this culture and the spread of the coffee disease lies in the soil or in the variations of temperature, but that it is simply due to the presence of the *Hemileia vastatrix*, a small insect borne by the wind, and which spreads quickly in every direction. A preventitive method for combating this enemy of the coffee shrub need not be despaired of, as people have tested the experiments of Doctor Burck, director of the Buitenzorg Botanical Garden, who has used with success different solutions, such as borax, chloride of iron, tobacco juice, &c. meanwhile the struggle is going on, but the use of the different methods has increased the general expenses of the culture and maintenance of the coffee plant.—*L and C. Express.*

GEMS AND PRECIOUS STONES OF AMERICA.

We have received from the Scientific Publishing Company of New York, a copy of a truly magnificent work, the scope and value of which are truly described in the accompanying letter, thus:—

"We take especial pleasure in announcing the publication of 'Gems and Precious Stones of North America,' by George F. Kunz. This book is preeminently the standard work of its kind and is indeed the only one which treats of the subject in a detailed and thorough manner. It is a systematic and at the same time a poplnar description of the several species and varieties of precious stones and pearls; their occurrence, value history and archæology. For the collector of precious stones and minerals it is especially valuable, the illustrations being all drawn from the finest known examples, and reference being made to the collections in which they may be seen. No work has ever appeared which furnishes to the archæologist and antiquarian so many references to the precious stones and pearls which have played an important part in early history.

"This magnificent work is profusely illustrated with the finest colored plates ever prepared for a book of this kind. The publishers have spared no expense to make this in every respect the finest example of American art."

Neither the value of the letterpress nor the exquisite beauty of the coloured illustrations is in the slightest degree exaggerated by the publishers, who have, with the author, reason to be proud of the addition they have made to the literature of America in general and of the science of mineralogy in particular. We hope, ere long, to have the pleasure of giving a more extended notice of this unique work.

ESTATE AND PLANTING NEWS.

The new Adjutant-General, Sir Redvers Buller, has severed his connection with Ceylon, having sold the estate Agrakande, so long managed by his late brother, to Lord Chelmsford, who, we are glad to see, is steadily extending his plantation interests in this Colony. Agrakande is a very desirable compact Dimbula property of 300 acres of which 257 are cultivated:—122 in tea, 110 in tea and coffee, 25 acres in coffee alone and with cinchona scattered over the place. The price paid has not transpired.

The experimental cotton plantation in the Matale district is named Florida and has 123 acres cultivated with cotton, out of a total of 152. The result of this experiment will be looked forward to with much interest as guiding future investments in plantations of cotton. If only the rich tank-irrigated lands farther North were made more accessible—by a railway—there can be no doubt that a large area would be put under this product.

THE CEYLON TEA PLANTATIONS COMPANY, LIMITED.

The following extract from the Prospectus published in connection with the call for preference shares is of general interest:—

The Ceylon Tea Plantations Company, Limited, was incorporated in December, 1886, and, for each of the three years since its formation, has declared dividends amounting to fifteen per cent per annum. The Company, the Ordinary Shares in which are held by comparatively few shareholders, has decided to increase its Capital by offering Preference Shares to the Public, and so provide funds for the cost and development of Estates recently acquired, and also to place it in a position to take advantage of favourable offers which from time to time may present themselves for pur-

chasing other properties. From the Chairman's long and close connection with Ceylon, and from the intimate knowledge of the planting districts possessed by the Managing Director and the Ceylon Staff, the Company has had exceptional opportunities of selecting and securing some of the best Tea Estates in the Island, and the Directors believe that these properties will materially strengthen the Company's position. The Estates are all Freehold, and the following is a Schedule giving the acreages, districts, and elevations. Those maked thus * are the more recent acquisitions. (Then follows a list of 14 estates aggregating :—

Tea in bearing Dec. 1889.	Tea not in bearing.	Approximate acreage to be planted with Tea in 1890.	Coffee.	Jungle, Patena, Waste, &c.	Total Acreage.
acres.	acres.	acres.	acres.	acres.	acres.
3,815	1,098	392	127	2,328	7,760

The small acreage under *Coffee*, at the present value of the product, yields satisfactory returns, and in addition to the area planted with Tea and Coffee, there are many thousands of *Cinchona* trees on the properties, which are also expected to prove a source of revenue, as practically no further expenditure is necessary for their cultivation.

The Company is doing a large and remunerative business in manufacturing Tea for other proprietors, and also as agents, making advances against crops, and in carrying on a commission business in all matters relating to Tea Estates.

The net profits earned last year were £23,370 14 8, and, it is expected, with the additional area under Tea, the profits for the current year, on a carefully prepared estimate will amount to £29,000. This would leave fully EIGHTEEN per cent available for dividend on the Ordinary Shares and for Reserve, after setting aside sufficient to pay interest on the Preference Shares now offered.

OUR INTERVIEWS.

THE BUDGET AND THE TEA TRADE.

A TALK WITH A TEA EXPERT.

Whether Mr. Goschen foresaw the extensive development of the tea trade which would follow when he made his Budget proposal to reduce the tea duty by 2d per pound, is open to question ; but the fact remains that there has been a very substantial increase in the deliveries, for on comparing the months of April and May (that is the month before and the month after the introduction of the reduced duty) with the same months of last year we find the important increase of more than five million pounds. In fact, the result of the reduction of the duty justifies the contention of the free traders that increased trade follows removal of duty, although no doubt something is also due to the growing popularity of " the cup that cheers," and the increased, sobriety and temperance of the people. The increase which during recent years has taken place in the production of tea has entirely revolutionised the tea trade, for the total supply of this country, which not long since was derived from China and Japan, is now principally drawn from India and Ceylon. The greater portion of the China crop has been gradually diverted to other countries, in many of which, even at the present time, it continues to be more appreciated than the less known produce of India and Ceylon.

These facts were accentuated in an interview which the representative of *The Oracle* had a day or two ago with Mr. Wilson, a well-known tea broker, and a member of the firm of Gow, Wilson, and Stanton of Roodlanc.

" Yes," commenced Mr. Wilson, " the deliveries for April and May were immensely heavy as compared with previous years, though it did not surprise me, as I know the way in which the trade has been growing. Some of the increase may be accounted for by the fact that a good deal was held over for the Budget, but even making allowance for that, the increase was very heavy."

" What will be the effect of the reduction of the duty ? "

" It will benefit good classes of tea at the expense of the bad ones, by causing the demand to increase for the former, and decrease for the latter, hence it will help British grown tea, and the result will be that eventually China tea will be

SQUEEZED OUT OF THE MARKET.

Indian and Ceylon teas are much stronger than the Chinese article, so that it is really a battle between the weak and the strong, and we know which must go to the wall."

" What do you think is the position of the public in regard to the reduction of duty ?"

" I think the public are buying better teas ; that is to say, they are paying the same price, but getting better tea for their money. The 2d. is really, at this moment, being divided between the planter and the consumer, but you must not forget that owing to the rise in the price of silver, the cost of production has gone up quite to the extent of 1d. in the pound of tea. I think the Silver Bill will have an effect on prices generally. The exact figure is 12½ per cent added to the cost of production by a rise of 2d. in the exchange value of the rupee. All produce which comes from the East will feel the results of the rise in the price of silver, and if it goes too far there are many tea gardens which will not pay to work. That will very likely make

A CRISIS IN THE TEA TRADE.

In all the principal tea-producing countries, labour, and everything else, is paid for in silver, and if the price of silver goes up, it will make everything dearer, machinery and all.* To show you the growing importance of the Indian tea trade, and the decay of the China trade, I will give you the figures for April and May in this year. In April the deliveries in China tea amounted to 4,685 000 lb. which increased in May to 11,510,000 or about double. In Indian tea, in April the deliveries were 5,155,000 lb. which increased in May to 14,492,000 or nearly three times the amount of last year ; while in Ceylon tea the deliveries rose from 1,334,000 lb. to 5,019,000, or nearly four times more."

THE ANNUAL RETURN.

"These figures complete the statistics for the season 1889-90, and show that India and Ceylon have expanded their deliveries—India having increased 16 million pounds within the last two years, and Ceylon having more than doubled in that period. On the other hand, the deliveries in China teas have fallen from 116,810 000 lb. in 1887-8 to 87,600,000 for the season just closed. The Foreign Office report, just issued, on the trade of Tamsui for the past year, says: 'The tea season of 1889 has been most unsatisfactory, both to foreign and native merchants. The teas of the island, which formerly had a distinctive character, are rapidly losing it, owing to the reckless competition amongst Chinese buyers for the Amoy market, and the careless preparation and fraudulent admixture by them of the teas after they have come into their hands from the growers. With the increasing competition from India Ceylon, and Java, in the opinion of those most competent to judge, the

DAYS OF THE CHINA TEA TRADE ARE NUMBERED,

unless steps are taken by the Chinese themselves in the direction of radical reform."

" Will the loss of the English trade affect China to any appreciable extent ?"

" Oh, no ! 100,000,000 lb. of tea is but a small drop in the ocean of what China could produce. Their own population consumes hundreds of millions of pounds. There is no necessity for China to send us tea at all." †

* Most of the machinery is imported and paid for in rupees the full equivalent of its gold prices, so that we cannot follow Mr. Wilson here.—ED. *T. A.*

† Except in this way : that not being able to pay in tea for English goods, she will have to pay more in the shape of silk or some other product, or in money Or the Chinese will cease to consume much of English manufactures which they now use. In Canton, a city of over a million people, we saw very little of English goods in the shops.—ED. *T. A.*

"How is the tea arranged for?"

"It is done in this way. A middleman goes up the country early in the year, and arranges for so much tea to be sent down to a given port. This is brought down and prepared for the European market by being what is called "fired," that is, dried on a plate. This process fixes the active principle in the tea, and kills the fermentation which would otherwise take place, and allows it to be shipped and carried to its place of destination. It depends on the price got for the first crop as to whether it is thought worth while to bring down other crops."

THE BATTLE OF THE TEAS.

"Twenty-five years, ago," proceeded Mr. Wilson, "our supply of tea was drawn almost entirely from China and Japan, and British-grown tea was then struggling into existence, though the cultivation of the plant in India was just becoming known in the commercial world. The growing appreciation of Indian tea by the British public so steadily encouraged this new industry that the article gradually cheapened: tea was thus brought within reach of the masses of the population, and its consumption greatly increased. Indian tea was found to possess qualities which imparted such strength and character to the weaker liquoring China teas, that it was largely used for blending. China tea reached its highest point in 1879, when about 130,000,000 lb. was consumed in this country, but since that time it has rapidly decreased, while Indian and Ceylon teas have as rapidly grown. You can see quite clearly this fact in this diagram, which shows the rise and fall of the two classes of tea with black and red lines."

"Do you think the reduction of the duty will continue to benefit British-grown tea?"

"Yes; we think it will do Indian and Ceylon teas good at the further expense of the China tea. Notwithstanding an advance in price, since April, of from 1d to 2d per pound in Indian and Ceylon tea, there has been no advance in the price of China tea, even when the Budget proposals became known. There was a strong feeling when the reduction was announced, that China tea being cheaper, there would be a run upon them, but the public evidently know when they

GET HOLD OF A GOOD THING,

and having tasted Indian and Ceylon tea they do not care to go back to their old love."

"You think the public taste is now settled in favour of British grown tea?"

"Oh, yes, and a man who once gives his customers Indian tea cannot get them to return to China tea."

"Where do the greatest tea drinkers exist?"

"In Australia and New Zealand, where the annual average consumption in pounds per head is 7·66. In England it is only 4·70, while in Canada it is 3·69. No European country approaches that amount of tea drinking. But in spite of the increase in the use of tea the production has run ahead of consumption, and nothing but the speedy opening of new markets can check the downward course of prices. Russia in spite of her large consumption takes very little Indian or Ceylon tea, but confines herself almost entirely to China tea, and consumes large quantities of the very finest and most delicately flavoured descriptions. Indian teas have now been introduced all over America and Canada, and are doing well, and their teas are now making the same strides abroad as at home."

"Are there special advantages in the preparation of Indian tea?"

"Yes, it is a perfectly clean tea. It is prepared entirely by machinery, and is never touched by the coolies from the time it is picked to the time it is drunk. There is machinery for everything. The China tea is manipulated by hand entirely, with no European supervision at all. It is never seen until it comes to the ports for sale, and they can put any sort of leaf in, and pass it off for tea. At one time green tea was

FACED WITH STEEL FILINGS,

and we used to keep a magnet in the office to test it with."

"As to the future of the trade?"

"Well, he who deals with futures is generally wrong, but my opinion is, and I think I am right this time, that Indian and Ceylon tea will gradually abolish the Chinese article. Mr. A. G. Stanton, a member of our firm, has just returned from a visit to the United States and Canada, undertaken in a great measure to ascertain the present position of the trade in British-grown tea. He says it is surprising to see what rapid strides have been made there by these teas. The industry is taking firm root there, and he feels sure that before many years have passed, the United States and Canada will be markets of considerable dimensions. Ceylon tea, he says, has certainly hit the American public taste, and the development of the trade will no doubt give better average prices to the planters."—*The Oracle.*

PLANTING IN DELI.

Throughout Deli in May the weather proved highly favourable for planting, though heavy rain fell on several estates. Most of the planters profess themselves highly satisfied with the outlook. The growing crops bear a promising appearance. On some estates, where planting had begun early, the tobacco is already in the drying sheds. Holt's company this year shipped 118,000 bales of tobacco against 87,000 during the corresponding period of 1889. The Deli Company reports a career of prosperity in 1889 on the sixteen estates in its hands, and congratulates the shareholders on the success of the efforts to secure coolies direct from China, though at excessively high rates which are expected to fall ere long. The quality of those from Amoy leaves so much to desire, that the planters will not have any more from that port, but the Government sets so little store by this feeling as to choose that city as station for the Netherlands Consul in South China. The company has not yet been able to engage Tamil coolies, owing to the Government delaying in concluding an immigration convention with the Indian authorities. It has too, an eye for higher things than tobacco planting, and has co-operated in a movement to station among the free Battaks in the interior a Protestant missionary to counteract the Mohamedan propaganda now busy among them. A worker has already been chosen, and funds for three years' trial under under his supervision have been collected. The continuation of the work after that period depends upon results.

The Chinese coolie who murdered Dermont, the estate assistant in Assahan, has been sentenced to death by the Criminal Court there. The execution will take place at the scene of the crime.—*Straits Times*, June 25th.

THE WESTERN FRONTIERS OF CHINA AND THE RIVAL INDIAN AND CHINA TEA TRADES.

A lecture delivered last month before the Society of Arts, by Mr. D. C. Boulger, the historian of China, will be read with much attention by everybody who is interested in the relations between China on the one hand and the three great European powers that are now, as it were, knocking at her western and southern gates, that is, Great Britain, France, and Russia. Apart from the desire of Great Britain to see the expansion of Russia checked in Central Asia, the Thibetan question will be watched with great interest by Indian traders, and principally by the tea planters of Assam, who are at present debarred from competing with the Chinese monopolists of one of the best tea markets in the world. On this subject, however, Mr. Boulger does not touch. Writing over twenty years ago on this point, Mr. T. T. Cooper, in his wellknown 'Pioneer of Commerce,' said that, with an open trade route, the Assam teas would drive

the China brick tea from Thibet. Chinese exclusiveness and the desire to preserve their monopoly has shut out Indian teas up to the present, and we fear that, having regard to the great injury done to the China tea trade in the foreign markets by the teas of India and Ceylon, the planters of Assam and Darjeeling must be content with casting longing, lingering looks at the mountain barriers of Thibet, and must not hope for any immediate opening for their teas in that market. That Mr. Cooper's view is the correct one is shown by the recent annual report of the Imperial Customs of China, where it is pointed out that Indian teas have quite driven Chinese teas out of Turkestan, where they latter had a practical monopoly a few years since.—*Rangoon Gazette*, June 16th.

FAILURE OF COFFEE ROASTERS.

(Official Receiver's Department.)

RE J. AND C. COLLIER.

Accounts have been issued under this failure showing liabilities 37,078*l*., of which 9,380*l*. is unsecured, and assets 8,163*l*. The debtors, trading as "James Collier & Sons," coffee-roasters, &c., of the Commercial-street Steam Mills, also as "Walker and M'Letchie," manufacturers of liquid extract of coffee, at Great Pearl-street, joined their father in partnership in June, 1877, the capital of the firm amounting to 7,824*l*. The failure is attributed to losses by depreciation in the value of their business premises and plant, &c., to losses by consignments, to bad debts, and to heavy interest on mortgages. The "fully-secured" creditors' hold mortgages on the debtors' freehold premises, and those "partly-secured" hold dock warrants for cocoa and chicory and a second mortgage on the Commercial-street premises. The first meeting is fixed for the 24th instant.—*Daily News*, June 19th.

PLANTING IN NETHERLANDS INDIA.

(From the *Straits Times*, June 18th.)

The Planters' Association at Sukabumie in Java have petitioned the Governor-General to allow the army in Netherlands India, in future, to draw its supplies of tea from local producers. The Chinese tea in use among the soldiers turns out to be bad and of low quality. The planters call attention to the strangeness of the fact that, while Java produces excellent tea, the army purveyors give the preference to inferior Chinese kinds.

The indigo outturn in Java shows signs of being 20 to 25 per cent below the crop of 1889. The falling off is said to be due to degeneration in the plants under cultivation.

Mr. E. L. Gordon, the pioneer concessionary of the Western Borneo Goldfields, has been recently to Batavia after starting a mining company in London with a capital of £300,000. The Company has eight Europeans at work in Montrado, who have already prospected with promising results.

In East Borneo, by last advices, European enterprise has made further headway than is generally known, but want of labour works as a drawback and trammels success in prospecting the gold and diamond mines there. The Batavia *Nieuwsblad* states that both the Rajah of Pasir, and the Rajah of Cotie in East Borneo, have decided upon leasing waste land in their dominions on easy conditions but, unfortunately, delays of office which demand the consent of the Governor-General to each concession stand in the way of much advantage being taken of their liberality.

Mongooses have been imported from India into the province of Kedirie in Java, to clear away field rats and other vermin which destroy the crops there.

On the 1st May last, the blockading squadron on the coast of Acheen consisted of nineteen vessels.

COOLY LABOUR.

(*From a Planting Correspondent.*)

The question of cooly supply for the coffee districts is getting beyond a joke, and Planters cannot cope with it without assistance. Do what we can with our Planters' Associations, appeal as we will to Government, the deaf ear is always turned to us, and help in any shape or form denied us; and yet if Government would only look at it in the light of Rs. As. Ps., it would see that the coffee industry has more to do in filling the treasury in coffee districts than it seems to imagine, besides the benefit that other districts derive therefrom. How many coolies do the coffee districts in Southern India annually employ, how much money do those coolies take away yearly to spend in their country? Almost every head of a house now owns land, and how did they accumulate the money to pay for it, and the yearly tax? Why, only by working on coffee estates. The advance they get buys the land, and one or two of a household are left to attend to it and one or two come to work off that advance, and help to pay the tax. What are the imposts in grain, fruit, salt, coconuts, beetle leaf, cloths, glass, bangles, &c., &c., &c., in a place like Coorg whilst the district is in full swing? Let Government enquire of the Commissioner, and then judge whether or no coffee as an industry is a thing to be lightly passed over. Take an estate of 300 acres, which should have one cooly an acre by rights for its proper working, and given that each cooly spends R4 a month in the district itself, that gives R1,200 a month, or a given sum of say, in eight months, of R9,600 Then say that each cooly saves R2 a month, that gives—to be taken to their country or held pay off the advance given,—say R4,800. This is only on one estate, and the number of estates in Coorg include large acreages now, belonging both to Europeans and Natives, so that the annual amount spent for working alone is immense, besides the work given, during crop; to bandy contractors for the conveyance of crop to Mangalore, Tellicherry and Bangalore. In fact if Government would only choose to take a little trouble and go carefuly into things, it would be astonished at the figures, and the amount of money expended by coffee planters for the benefit of the country, exclusive of the very handsome amount paid into the Treasury on coffee assessment, income tax, bani tax, &c., &c. What was Coorg years ago before the country was opened out, and what is it now? This I will leave to Government reports. Yet now a crisis is coming, and it is either recovery or death, as the planter cannot fight on singly much longer, for the want of labour is telling most emphatically on most valuable property. The planters have no hold over maistries to whom money has been advanced has been shown over and over again; and planters as a body have again and again tried to get help from Government in such cases. The last endeavour was that all maistries should have a registered certificate from the parpiteyar, or subadar of their villages as to their being persons to be trusted to bring in labour. Not a very great request this, but we might as well appeal to the gods of the heathen, as to a Government which takes all it can get from its struggling offspring and gives nothing in return.

What is the use of planters struggling on against such odds? In bad years ryots get a deduction in tax money. Do we? No, our places may be going back from short crops and not sufficient labour to work them, but to ask for a reduction in tax would be the height of insult, and the reply would be equivalent to, "No, you are not natives, to them we grant every thing asked, to you not the stretching forth of a little little finger." Where is the use of planters spending money year after year in supplying their estates when it is too late? At the beginning of June everything should be ready for this all-important work, but now-a-days there is not a cooly in, they are quietly reposing in their country, daily attending to their fields, and eating the planters' advance whilst we are longing for them to come. Our work is all behind, our coffee is all in weeds, which are eating all the manure we have put in for the benefit of the

coffee; not a pit has been made for next year's supply, that should have the whole benefit of the short monsoon we have, and so another year is lost. Nothing can be done to the maistry for breaking his agreement by not coming in by the 15th of May, and so we are the losers year by year. And what is the consequence? Fields that could have been planted had labour been in have to be abandoned, for there is no use of thinking that it is borer that is decimating the estates; it is want of labour at the right time. Where is the use of supplying at all when it has to be done at the end of July, and after the middle of August, when the place, too, is as full of weeds as it can be, that only choke the supply before a weeding can be done; and how can pitting be done properly in weeds three feet high? Every work must be done in its order, and yet this is an impossibility now. If we do not get supplies up, there is no use continuing in coffee, and that we have a poor enough chance of getting them up is universally felt by all. Besides when the first and principal work is so far behind, all the other works suffer in consequence. Shade is, to a large extent, required and must also be planted out early, but this has to be given up generally (a work second to supplying). Then digging and all turning of the soil, should be done during the rainy season, and this has to be left till the end of the monsoon. And why is there all this loss of time, simply owing to the fact of the labour supply not being sufficient or rather no labour in at the first, and whose fault is it? Superintendents are blamed, but it is no more their fault than the man in the moon's. Cooly pay has been increased this year as an inducement, but the Mysore cooly is far too well off in his country (having fattened on his gains, from the coffee district) to trouble about coming in, and when the maistry, from whom he has taken advance, goes to his village to call him to go to the estate, he flatly refuses, knowing very well that he cannot be compelled, although he has signed an agreement to work from a stated time to a stated time, generally from eight months to a year on the estate. Coolies, before being paid off in March, are only too eager to take an advance; but let them go to their country, and it takes no end of persuasion to make them make up h mind to return. Can nothing be done to help the mstry, when in his country, to force the cooly to return or have him fined, there and then or imprisoned? What is the use of warrants being issued when the maistry must first go to the coffee district to a Magistrate there before he can get one for the cooly, and then the warrant never can find him, and the maistry is so far from him, he cannot go to look for him, as his work is on the estate, looking after what coolies he may have brought in with him. The evil that this men-catching by warrant is invoking is now widespread, as coolies are knowing enough now to elude any warrant sent, and so laugh at the whole proceeding. Now, I ask, is it just or fair that Government should let valuable properties suffer by not giving some small assistance to the planters, for in the end it will be the loser as well as the planter who has done his best, and yet lost money by spending it in this country in coffee when so heavily handicapped. Let there be a famine in the Mysore district, as there was some years ago (which God forbid) and we will have shoals of worthless people come to us for the sake of food, and Government will be glad that the people are provided for and off its hands, and that the planters who have been so in need of labour will now have their estates worked for them. What would Government not have given to have had some thousands of people provided for during the famine in Ganjam, and that we can employ thousands there is no doubt. Why should Government send cooly labour to foreign countries when it is so much needed nearer home? Coolies don't like to leave India, then why not arrange with us? We can employ them but must have as good arrangements made with us as is made for those who got labour sent them outside of India. There is an immense field here, for Mysore labour is failing us utterly, and to get labour from over-populated districts would be a boon to distressed coffee planters.—*M. Mail*, June 27th.

NOTES ON POPULAR SCIENCE.

BY DR. J. E. TAYLOR, F.L.S., F.G.S., &c.,
Editor of *Science Gossip*.

PLANTS—GUM TREES—CORAL.

A German botanist, who has been for some time engaged upon the mathematical study of the contrivances for hindering the descent of parts of plants to the ground, and for favouring their aerial transit, sums them up as follows:—1, Dust-like (Schizomycetes, fungus, and fern spores, &c., and the pollen of wind-fertilised flowers); 2, fruits furnished with bladders (as in many of the orchids); 3, hair-like seeds; 4, disc-like and flat (like the fruits of the elm and some of the lilies); 5, parachute seeds (like the hosts produced by composite plants, and others in the Dipsaceous and Plumbaginaceous orders); 6, cylindrical and winged (like the fruits of many of the Polygonaceæ); 7, fruits with ridges giving a sail-like form (like those of Ailanthus): and 8, samaras, as the wellknown fruits as the ash, maple, &c., are called, whose structure enables the wind to carry them away with the screw-like motion. The remarkable thing is how so many plants which have not the slightest botanical relationships to each other have managed to hit upon the same identical devices—to take out the same patents, in short.

You do a good deal of "ringing" in your gum-tree forests in Australia. There is no sight which struck me more out there (with rather a melancholy impression) than the dead, standing forests of ring-barked gum-trees, looking so weird that Gustave Doré would have been delighted to have sketched them some moonlight night. They seemed to me like so many vegetable ghosts. I am reminded of my experience by reading some remarks made by a German professor of forestry on the subject. He goes in for "ringing" scientifically, and shows that the ringing of branches produces a more active growth above, and a less active growth beneath the ring. Starch is usually entirely absent from the portion below the ring, whilst oxalate of potash is usually most abundant there. Of course, the German foresters "ring" their trees to do them good, not to kill them so as to clear the land.

In a recent paper read before the Royal Society of Edinburgh, Dr. John Murray, of "Challenger" fame, discussed the question at the origin of coral reefs and other calcareous formations in recent seas. Calcareous remains are found in great abundance at the sea bottom in shallow waters, but the amount steadily diminishes as the depth increases, until at four thousand fathoms almost every trace has disappeared. Dr. Murray thinks this is due to solution as the organisms slowly fall to the bottom. Within five hundred fathoms of the surface the ocean everywhere teems with life. This is an important fact to record, as the ill-fated "Greely Expedition" actually starved within ten feet of abundant food, which might have been obtained by breaking a hole in the ice and using a shirt as a drag net. Dr. Murray is of opinion that the chief reason why there is such an extraordinary growth of coral in tropical regions is because carbonate of lime is continually produced in large quantity by the action of sulphate of lime in solution on effete products, and that the absence of coral reefs on certain shores is explained by the uprise of cold water due to winds blowing off shore.—*Australasian.*

COMPRESSED TEA.—The *Kew Bulletin* for June contains an account of the manufacture of compressed tea at Hankow. This tea is in use throughout Russian Siberia, and is made of tea dust compressed by steam power, and differs from the brick tea of Tibet, which is made of the entire leaves pressed together. The Timber trees of the Straits Settlements are next passed in review, the notice being founded on the collections of the late Dr. Maingay. The remainder of the part is taken up with correspondence, showing the desirability of extending the cultivation of Cotton in West African colonies.—*Gardeners' Chronicle.*

BARK AND DRUG REPORT.

(From the *Chemist and Druggist.*)

LONDON, June 19th.

CINCHONA.- The fortnightly auctions were held on Tuesday, and oonsisted of a moderate assortment, the catalogues comprising the following quantities :—

	Packages		Packages	
Ceylon bark	1,455	of which	1,172	were sold
East Indian bark	524	do	435	do
Java bark	46	do	45	do
South American bark (Calisaya)	370	do	132	do
Total	2,395	do	1,784	do

A fairly satisfactory tone prev iled throughout the auctions, and occasionally competitions become rather brisk, a great many lots being divided among two or more buyers, one firm cutting in as soon as another attempted to drop the price. The prices realised were rather irregular, but the average unit is placed just a trifle above that of the last Amsterdam sales, say at 1½d to 1⅝d per lb. for fairly good b rk. The Ceylon barks offered did not inolude anything of particular interest, although there were several parcels of good Officinalis bark among the supply. From India there was a fair assortment, and several parcels of renewed red shavings and chips sold at unusually high rates. The South American barks consisted exclusively of Bolivian Calisaya quills, whioh are gradually becoming a feature of some importance at our auctions. It may be mentioned that the supply of root bark at the sales was comparatively heavy, the total weight of this descriptiou of bark being nearly 50,000 lb.—mostly Succirubra from Ceylon.

The following are the approximate quantities purchased by the principal buyers :—

	Lb.
Agents for the French, Italian, and American works	110,588
Agents for the Mannheim and Amsterdam works	106,089
Agents for the Brunswick works ...	65,693
Messrs Howards & Sons ...	56,373
Agents for the Auerbach works ...	45,445
Agents for the Frankfort o/M and Stuttgart works	23,651
Mr. Thomas Whiffen	18,485
Sundry druggists, &c...	37,245
Total quantity sold	463,569
Bought in or withdrawn	117,416
Total weight of bark offered ...	580,935

It should be well understood that the mere weight of bark purchased affords no guide whatever to the quinine yield represented by it, firms who by a sm ll quantity of bark by weight frequently taking the richest lots and *vice versa*. An analysis of the catalogues gives the following prices for sound bark:—

QUININE.—Lower. At the beginning of the week no business was reported, but yesterday and today about 40,000 or 50,000 ounces; B. & S. and Brunswick have been sold by second-hand holders on the spot at 1s 1½d per oz.; that is the market quotation today.

TEA SCALE-INSECT.

Mr. E. C. Cotes wrote regarding the tea scale insects received from Kangra, that Mr. Atkinson identified them as of the family *Coccidæ* and Genus *Ceroplaster*, probably a new species, and that they had been sent to Mr. Maskell for examination and descriptions, if new. Mr. Cotes also asked for further specimens, especially those showing the different stages.

Mr. W. H. Miles sent the following note on the Tea Scale-insect which has been recently observed in the Kangra Valley. As coogenerous pests which have attackod the Orange and Coffee have doue such serious damage, members observing this new enemy to tea are requested to commuuicate with the Society on tho subject, and to collect specimens of the insect in all its stages so that it may be identified, and more of its life history known:—

Since 1868 wheu they first began to attract attention,* the family of Scale-insects have made themselves notorious as one of the most dreaded and destructive of a'l the known enemies of plant life. First noticed in Australia, they travelled on to Cape Colony, and finally appeared iu California, and as soon as they had established themselves in a new district proceeded to spread in all directions. In Cape Colony aud California the principal sufferer was the Orange tree, and so great was the damage done, that many owners of Orange groves were ruined. In Ceylon, the Scale-insect has done immense damage to the coffee-plant, and many plantations have been closed in consequence.

In order to mark its coming of age, so to speak, it has turned its attention to tea, aud already is has done no inconsiderable amount of damage to the bushes. It first appeared on two gardens in the Kangra Valley in the early part of this year (1889) and has since been reported from Assam, but there is nothiug to show the manner of its introduction in either district. There is reference in Part 1, Vol. 1. Indian Insect Pests, to a new coccid found on Cinchona in Sikkim which matures about April, and as the Scale-Insect was first observed on tea about that time, there may be some connection between the two

There is little to describe about the [actual insect, as it has not yet been observed in a free state. When a plant is attacked it soon becomes covered with little brown scales about one eighth of an inch in diameter, which adhere closely to the stem of the plant, but can be easily removed by inserting the blade of a penkoife under them. Under the microscope these appear to be cases only, as there is no structure apparent, and in several I have detected a small puncture through which I imagine the imago escaped. The insect appears to be most active in bright weather and almost disappears in the rains. Some specimens forwarded to me in November last were of quite a different character to those described above, the scale being soft and pulpy and covered no the outside by a thick coating of soft white waxy-looking substance. This may prove to be the female.

Its effect on the tea-plant is somewhat similar to that caused by the tea-bug, but more marked, as the Scale-insect appears to absorb the juices of the plant through the stem, and the bush immediately begins to sicken, aud would soon die down unless prompt measures were taken.

The most effective remedy is the kerosine emulsion which has been used with very good results in the United States and Ceylon, against the forms of Scale-insect attacking the Orange tree in the former and Coffee in the latter country.

The formulæ for preparing the Kerosine emulsion recommended by the U. S. Department of Agriculture, were reproduced in Vol. VII, Parts II and III of the Society's Journal.

I have already discovered a parasite of the Scale-insect which closely resembles Coccophagus californicus, figured in the Periodical Bulletin of the U. S. Department of Agriculture, division of Entomology, for March 1889. Though it may take some time for it to develope properly in order to be an effective enemy of the Scale insect, it is satisfactory to know that it is in existence.

This short note is merely intended to draw atteution to a subject which may occupy a prominent position in the near future. Though not wishing to appear as an alarmist, I fear that tea is threateoed with a new danger, which may do more harm than any of its predecessors, judging by what has happeued in other parts of the world. I would seriously impress on all connected with this great iudustry, more especially managers of gardens, to be on the alert, and at the first indication of this pest, to adopt remedial measures at once to stamp it out, otherwise there is no telling what the consequences may be.—*Proceedings of the Agricultural Society of India.*

* The ravages of black or brown bug on Coffee were noticed in Ceylon nearly thirty years ealier than 1868, and were the subject of an elaborate report in 847 by the government botanist, Dr, Gardner.—ED. *T. A*

COTTON.—In the Northern and Western parts of Mysore a species of cotton plant grows known to tho natives as the *depathi mara* or candle plant. The seed pod is about two to three inches in length and divides in three sections when ripe, each section containing a cluster of seed closely patched with cotton wool. If the narrow end of the section be lighted, it will keep a flame for about ten minutes, the seeds giving off a large quantity of oil. The cotton is of no use for spinning, the yield from each pod being extremely small.—*Indian Agriculturist.*

THE RISE IN CEYLON TEA EXPORTS.—Very strikling is it to see in printing off a table of Staple Exports of Ceylon for 53 years from 1837 to 1889 inclusive, for our Hanbdook, that *Tea*—now the greatest of all—is first entered in 1873 for 23 lb. exported, and this has developed in 17 years into 34,346,432 lb. valued by the Customs at £1,786,014 in 1889!

CINCHONA BARK FROM FIJI AND THE WEST COAST OF AFRICA was offered at a recent London sale; and Messrs. Brooks & Green report on the same:—113 packages from West Africa, weighing about 6 tons, were included in the auctions 22nd April: the quantity was rather above the recent parcels and sold from 4½d to 6d a lb. 6 bales Fiji bark, quality poor, 4 bales sold at 2d a lb.; 2 bales at 3d a lb.

GRASS CROPS AS AFFECTED BY MANURE.—Good feeding grass and shelter are the main desiderata in stock rearing in Ceylon, and it is interesting to find Sir James Caird in a review of British agriculture stating that the experiments of Sir John Bennet Lawes had shown that the natural produce of grass may be doubled and even trebled by the continuous use of special manures. Trials in this direction and in that of growing superior pasturage by irrigation are needed in Ceylon.

CREOSOTED TIMBER.—We occasionally receive complaints from gardeners and their employers concerning the injury done to plants when creosoted timber is employed in the construction of plant-houses, and the impossibility of minimising the injury by any known means. Mr. Archibald Mackie, gardner, Rosehaugh, Avoch, Ross-shire, writes, that his structures, consisting of Orchid and Melon-houses, vineries, ferneries, are constructed with creosoted timber. which causes no injury to the plants contained in them, although the creosote oozes through the paint, and is very perceptible to the sense of smell. We should be glad to have the experience of gardeners and others who have had charge of plants in houses built of timber similarly treated.—*Gardeners' Chronicle*.

QUININE.—It is a curious fact-says the *H. & C. Mail*—that while the annual supply of quinine for the whole world is estimaled at about 6,000,000* oz., more than 3,000,000 oz.—one-half of the entire quantity—are cousumed in the United States. Owing partly to over-production, partly to the substitution of other drugs for quinine, the price of the article bas fallen so much of late years that large plantations of the cinchona tree have been uprooted in Ceylon, and the tea plant cultivated in its place. The exports of the bark from Ceylon, in which islaud the cinchona is extensively grown, declined more than one third between 1885 and 1887.

THE GRIEVANCES OF MYSORE COFFEE PLANTERS.—Ever sinoc the rendition, the European coffee planters of Mysore have been complaining of the remiss manner in which the Breach of Contract Act is being worked in the Mysore Province. Those who know how much capital has been sunk by them in opening coffee plantations wish that every help should be given to them, so that tho resources of the country may be developed as much as possible. The Mysore Government has not however, till now, paid any heed to their grievances. The fact that *maistries* take large advances from the planters undertaking to supply them with coolies and then deceive them, is well known, and the sooner therefore some more efficacious and speedy remedy is found the better. The Breach of Contract Act is too antiquated and it requires revision so that it may be adapted to the present changed circumstances.—*Cor., Madras Times.*

* Our estimate of tho world's cousumption is nearer 8 million ounces—ED. *T. A.*

TWO LARGE CONSIGNMENTS of Canadian seed grains—wheat, barley, oats etc.—have just arrived in India for experimental cultivation, and the experiments will be made in the North-West and the Punjab.—*Indian Agriculturist.*

MYSORE, July 3rd.—Crops will be short this coming season in Mysore, and the same is reported from Coorg. We had a heavy downpour latter end of December which kept the trees green all through the hot weather, and the blossom showers were unusually early this March, which prevented the bud-bearing wood to winter, and April turning out a heavy rainfall, the blossom that came out did not set as satisfactorily as was looked for.

PLANTING IN NORTH BORNEO.—The report of the Directors of the North Borneo Co. just out when the mail left, has the following paragraph:—

The Directors are glad to report that the progress which set in last year in consequence of the attention given to tobacco planting shows every prospect of continuance, as evidenced by the large sales of land and the marked improvement that has taken place in almost every item of revenue. Attention is also being given to the cultivation of other products: the suitability of the company's territory to the growth of Liberian coffee has been successfully demonstrated in Marudu Bay. Altogether the prospects of the country are encouraging.

CALIFORNIA CORRESPONDENTS, says *Gardens and Forest*, speak of the great success which has attended the "colony system" recently introduced in the southern part of the State. Tracts of land are laid out in small holdings and apportioned among a body of immigrants, who, upon their arrival, find everything ready for work. A body of colonists from Holland who arrived not long ago at Merced, found houses build and gardens and orchards arranged, more than two thousand acres having been planted with fruit-trees and vines; and fifteen English families were established a few weeks ago at Bakersfield, in Kern County, each receiving a forty-acre holding similarly prepared.

ARRIVAL OF PEPPER FROM EDIE.—The steamer "Hok Canton," which arrived from Edie on Saturday, and the steamer "Washi," which came in the following day, both brought shipments of pepper from that port. We understand that these consignments having been contracted for last year, were allowed to be exported without extra duty being charged, and that there are still some 13,000 bags of such pepper to come here. Pepper contracted for this year will not be allowed to be shipped until the hostilities against the Achinese in Edie are brought to a close, when an extra duty will be levied on it to recover expenses incurred by the Dutch in consequence of the recent fighting.—*Pinang Gazette*, June 24th.

AN IMPORTANT MEXICAN SCHEME.—We (London *Times*) understand that a new undertaking on a large soale has been formed on the principle of a trust company, whose sphere of operations will be in South America and Mexico, the present time being considered favourable for occupying the ground in that quarter. The capital will be £3,000,000 in £10 shares, of which 200 are founders' shares. Apart from the investment of its funds, the Company will undertake the acquisition of concessions and other business connected with the above mentioned countries. The directors, we are informed, believe that a satisfactory profit will also be made by co-operating in public issues, and for that purpose the Company will work in close alliance with the Trustees, Executors, and Insurance Corporation, Limited, and with Messrs. C. de Murrieta & Co. Two of the members of Messrs. Murrieta's firm will it is stated, be on the board.—*Public Opinion*, June 13th.

CEYLON TEA IN AMERICA.

We now call attention to the full report of yesterday's meeting (page 122.) There can be no doubt that the Company is fortunate in getting Mr. Grinlinton to represent them in New York; for besides his well-known business capacity, he has a direct personal interest in the fortunes of Ceylon tea and will, we feel sure, do nothing to risk its good name. It was mentioned at the meeting that if the negotiation with Messrs. Wattson & Farr fell through, the Company must cease operations through its capital running short. Now this was a blunder—and worse, in a small way,—a crime! How is the Ceylon Agent to hold his own in New York, if this is the intelligence given to the other side? The fact is that the further capital has not been forthcoming, because the interest which yesterday's meeting and much more Mr. Grinlinton's trip Westward, will arouse, was wanting. Let our Agent only report back that the promoters of the new Company refuse to bind themselves *to sell none but pure Ceylon tea*, through their "Ceylon Planters' Company," and at the same time demonstrate that there is a profitable business to be done,—and we may be sure the further capital required would be forthcoming. In fact, we should then vote for closing the Tea Fund—and devoting that self-imposed tax and all spare capital to the Ceylon American Tea Company. Let our New York friends therefore make their mind easy as to our Company being handicapped, and our agent in a corner. He goes with a free hand and will, we feel sure, not commit his brother tea planters to any conditions not fully to be commended on mature consideration.

CEYLON AT THE NEW ZEALAND EXHIBITION.

Dunedin, June 7th.

A. Philip, Esq., Secretary Planters' Association, Kandy.

Dear Sir,—Since writing to you on 30th April (copy of letter herewith) I have received your favour of 1st May. In reply I am sorry that the case shipped by Mr. Geo. D. Jamieson did not reach me, and I can find no trace of it.*

AWARD CERTIFICATES.—By this mail I send to Mr. Carlyon parcels receipt for a box addressed to you and covering a tin lined case, containing the whole of the Award Certificates as per list enclosed herewith.†

I have asked Mr. Carlyon to clear the box and forward it to you.

ACCOUNTS.—Enclosed please find a statement of receipts and disbursements by me on account of your Court. I send you herewith Draft on London for £37 10s, the balance being not yet fully collected. There are still some photographs in frames and a few other small things to dispose of for which I trust to send you a remittance shortly. Valuing the kiosk in my hands at £50 it will be seen that after all disbursements here, and including the passages of the native servants to Ceylon, the net outlay defrayed by you for disbursement in this colony will be under £90, which I trust your Committee will consider satisfactory.

KALUTARA CARVED WORK.—I regret to state that four sets of articles forwarded by Mr. G. M. Fowler, C.C.S., on account of Sinno Wadu Arachchi and invoiced at R145, are unsaleable here at a quarter of the equivalent of that sum. One carved coconut shell invoiced at R25 I sold for £1: the rest are retained pending instructions.—I am, dear sir, yours faithfully,

(Signed) W. WATSON.

* We omit the correspondence between Mr. Jamieson, Mr. Philip and the Wharf and Warehouse Co., on this subject: it is very unfortunate that a special assortment of fine teas from Mariawatte failed to reach Dunedin—appropriated in Melbourne doubtless?—ED. *T. A.*

† This list is identical with that which we published on March 26th (page 311 *Overland Observer*) save for the closing awards in cinchona, &c., which we reproduce now.—ED. *T. A.*

CINCHONA BARK.

F. G. A. Lane, Blair Athol, Ceylon		First award
W. Jordan & Co., Ceylon		do
COCOA.		
North Matale Estate	...	First award
Gangarowa	...	Second award
Charles Mackwood	...	Third award
ARROWROOT.		
R. P. Jayawardene	...	Second award
KALUTARA WORKMANSHIP.		
G. M. Fowler	...	First award
KANDY ART WORK.		
	...	Second award
CANE FURNITURE.		
T. J. Ramlan	...	Commended.

Signed W. WATSON.

STATEMENTS OF RECEIPTS AND DISBURSEMENTS BY W. WATSON ON ACCOUNT OF THE PLANTERS' ASSOCIATION KANDY, AT THE DUNEDIN AND SOUTH SEAS EXHIBITION, 1889-90.

Receipts.

		£	s.	d.
Received	from Secretary, P. A., Kandy ...	150	0	0
Do	for cups of tea, &c., sold in kiosk ..	466	19	2
Do	for duty refunded by N. Z. Government	14	8	6
Do	for sales of tea and coffee exhibits ...	45	19	6
Do	for sales of tea for consumption unused	25	17	0
Do	for sales of kiosk furniture, &c. ...	22	8	3
Do	for sales of ebony, elephants, &c. ...	8	5	0
		£733	17	5

Disbursements.

	£	s.	d.
Cost of kiosk	50	0	0
Do of exhibition space	20	0	0
Do of erecting and flooring kiosk... ...	50	10	0
Do of furniture, linoleum, gas fittings, crockery, &c.	94	7	2
Do of advertisements	26	7	6
Do of photograph frames	7	4	3
Sundry payment for sugar, milk, biscuits, freights, gas duties, washing, dinners to servants, extra service, &c., &c., &c... ...	173	5	0
Mr. K. S. Begg's salary	78	0	0
Wages to Jayanhami	39	14	2
Do to W. Fernando	42	3	9
Do to J Roderigo	40	8	4
Native servants' expenses in Dunedin ...	46	5	6
Do passages to Melbourne (reduced)	7	10	0
Remittances to H. Mackenzie, Melbourne ...	13	1	11
Remittance to Secretary, P. A., Kandy ...	37	10	0
Balance	7	9	10
	£733	17	5

(Signed) W. WATSON.

Dunedin, June 7th, 1890.

June 7th.

T. J. Parker, Esq., B. S. C., Dunedin.

Dear Sir,—As representative of the Planters' Association of Ceylon at the Dunedin and South Seas Exhibition of 1889-90 I have the pleasure to hand you for the benefit of the Dunedin Museum twenty four specimens of Ceylon Birds and a box of Ceylon Butterflies.—I am, &c., (Signed) W. WATSON,

Inspector Colonial Bank of New Zealand.

List with names of birds enclosed.

QUININE-WORKS FOR SALE.—As will be seen from an announcement in our advertising columns, another quinine-factory is about to be offered for sale by public auction. This time it is M. L. Viennot who desires to dispose of his factory at Ivry-Port, near Paris, where he has carried on for many years the manufacture of cinchona derivatives and other medicinal alkaloids.—*Chemist and Druggist.*

SPECIAL MEETING OF THE CEYLON PLANTERS' AMERICAN TEA COMPANY, LIMITED.

PROPOSALS FROM AMERICA FOR THE RE-ORGANIZATION OF THE COMPANY.

In accordance with due notice a special general meeting of shareholders in the Ceylon Planters' American Tea Company, Limited, was held at the offices of the Company in Queen St. yesterday, commencing about 1 o'clock. Mr. L. H. Kelly (Chairman of the Company) presided, and the other directors present were Messrs. G. A. Talbot, Harry Whitham, C. Spearman Armstrong, W. W. Mitchell, J. J. Grinlinton, and Thos. North Christie; the shareholders present were Messrs. J. H. Renton, C. Oswald Mackwood, H. J. Vollar, Sholto G. D. Skrine, F. G. A. Lane, W. H. Davies, Eastern Produce and Estates Company by their attorney, C. B. Smith by his attorney, F. M. Mackwood, H. D. Deane, A. Vanrenen, Gilbert F. Traill, F. G. Bewes, A. Bethune, H. V. Lushington, H. L. S. Ingles, J. F. Headrick, H. Bois, P. Bois and V. A. Julius.

The Hon. W. W. Mitchell, who acted as Secretary, read the notice calling the meeting, and the minutes of the last meeting held on the 12th February 1890, which were confirmed.

The Chairman said that he would make a few remarks to point out the necessity of calling the meeting. The necessity had arisen from a letter which they had received from Messrs. Wattson & Farr of New York, dated May 15th. The letter would be read to them presently, but its main object was to point out Messrs. Wattson & Farr's opinion that a very much larger business might be done in Ceylon tea in America by the co-operative system, as they called it in America. There were many ways of doing things in America which were strange to them, and which might at first seem beyond their ken, but Messrs. Wattson & Farr's idea was to make a number of persons in fairly good circumstances shareholders in this Company, to allot them so many shares, and to supply them with tea, holding their shares fully paid up as security, and to make them, in fact, the Company's agents; to appoint them in all the various small towns, and to get them to travel about and do as much as they could to increase the volume of the sale of Ceylon tea. The directors had given the proposal of Messrs. Wattson & Farr their deepest consideration. They proposed to raise a capital of one million dollars, and to apply to the present shareholders two shares of 20 dollars each for every one share that they now held, so that the holder of a share worth R50 would, at the present rate of exchange, get an amount equal to about R108 for his share, provided he chose to remain and amalgamate with the American Company. Messrs Wattson & Farr proposed to reserve 10,000 shares as the working capital of the concern, and they proposed to take 28,000 shares for themselves and the promoters of the Company. The Directors thought that a great deal too heavy an amount: they objected to it, and telegraphed to Messrs Wattson & Farr pointing out their objection. He would ask the Secretary to read the telegram that was sent.

The Secretary said that the following telegram was sent on the 1st of July:—"Directors provisionally approve—promotion shares deemed excessive—shareholders called—writing." In reply to that came the following telegram:—"Promoters fully considered all points—cannot alter conditions—Delay likely prove disastrous—Prompt confirmation most important." An answer was sent:—"Will cable you on 11th"—this date.

The Chairman, continuing, said they would see that although the directors immediately took steps and objected to so large a proportion of the shares being allotted as promotion money, the promoters in New York seemed to think they would require that large sum of money in order to promote the Company and to push the concern. There was no doubt that a very large sum of money would be necessary, but whether the sum named was absolutely necessary or not it was very difficult for them to say. But they did think, as a Board of Directors, taking all matters into consideration, that whatever was done must be done promptly. Their great object was to push the Ceylon tea enterprize, and they considered that they would be able to do a very much larger and much more extended business in accepting this scheme. (Hear, hear.) One thing was perfectly certain, and that was that the Company had not been supported either at home or in Ceylon as well as it ought to have been, seeing the very heavy expenditure in working anything of the sort in America, and they thought it would be to the mutual advantage of the shareholders if they would agree to amalgamate the Company under the proposals made by Messrs. Wattson & Farr. The directors wished to take the shareholders entirely into their confidence in the whole matter that had been laid before them, and therefore he would ask the Secretary of the Company to read the letter which had been received from Messrs. Wattson & Farr, and then to read the reply which was sent.

The Secretary then read the following correspondence:—

New York, May 15th, 1890.

Messrs. Darley, Butler & Co.,
Agents and Secretaries, Colombo.

Dear Sirs,—Since last writing you we have your esteemed favours of March 26th and April 8th, contents duly noted, and all enclosures in order.

Mr. Pineo has continued to use his best efforts in increasing sales of Tea, and we see signs of a growing interest amongst those who have given the article a fair trial. At same time the increase is very slow; and to make the Company a success, some vigorous and extended effort must be made.

We have been, as we have already written you, much interested in the experiment, and have given the matter our very careful attention, but must say that had we known how small a proportion of the Company's shares would have been taken we should have hesitated about accepting the agency, and would most probably have advised that the attempt to start the business should not be made. We have done our best with the funds provided, and feel that all the money spent has been used to the very best advantage, but with the present resources of the Company it is only a question of a few months, when all the money will have been spent and the business simply started.

It has been, therefore, a matter of considerable thought with us to advise the best way to avert the impending disaster to the Company, and make the efforts and money already expended the stepping-stones to a permanent success.

You may or may not be aware that the co-operative principle in many forms of business is taking great hold of our people at the present time, and after careful investigation of the matter, we are of the opinion that this co-operative idea can be used with marked success in the promotion of the plans of this Company.

We have in this country a very large class of people, who have some means and are able to live without going in for any very engrossing business, but who in many instances would be very glad to add to a small income by some clean and reasonably profitable occupation, without losing their independence. These

people live in the small towns throughout the country, and would be in a position to have a horse and waggon at their command, to drive about through the country| soliciting trade.

We have secured the interest of parties here whose business it has been to reach this class of people, and who have the necessary machinery and experience to interest them in any good legitimate enterprise; and our plan is to secure an agent and stockholder from amongst this class, all over the country, commencing in our more thickly settled States, near at hand, and lying within a convenient radius, around our principal cities.

No agent will be appointed who does not subscribe to some shares, and he must be qualified and undertake to push the interests of the Company in the territory that may be assigned him. The amount of shares would vary from $100 to $1,000, and he would be allowed to deposit his shares (fully paid up, of course) as security for tea sold to him which would be billed at a price to enable the agent to make a handsome profit, at the same time giving the Company a handsome return. He will have the double incentive of a profit on sales and a dividend on his stock, besides which his ownership of stock will give him an interest in keeping at work in his territory even should sales not prove large at first, as he would realize that his investment in the stock would prove valueless, unless himself and his fellow agents all continue to work for the common good.

Whilst working up the class of people we have referred to above, we do not by any means propose to neglect the principal cities, but would work them into co-operation in the general business either by means of local agents or by establishing branches of the Company itself.

Our idea in brief is as follows:—To incorporate a Company (American) under the same title as the present with a capital of ($10,00,000) one millon dollars, divided into shares of ($20) twenty dollars each fully paid up, and non-assessable, incorporate under the law of this State, and without liability to the shareholders. The shares to be divided as follows:—

10,000 shares to be placed in the Treasury of the Company to be sold at par—say $20,00,000 for the working capital of the concern.

12,000 shares to be paid to the shareholders of the present Company, say 2 shares for every one, and 28,000 shares to be paid to ourselves and the parties who will work with us in raising the capital and floating the enterprise, and we would all have to give much time and labour to the matter, and advance a great deal of money for advertising, travellers, &c. &c. before we could look for any returns.

It is not by any means our desire that any of your present stockholders shall part with their holdings, but rather that you may get increased subscribers, but we can doubtless arrange that any who do not wish to accept the 2 shares of the new Company for the one of the present Company shall receive the amounts they may have paid in, upon surrendering their shares. Still less is it our desire that any of the present Directors should be displaced, as we wish to have the new Company to be the outgrowth and harmonious result of the present one, and only such changes or rather additions to the Board of Directors would be made as might be found necessary by our local laws and to enable us to have the proper working board and officers here, where the work would have to be done.

As we understand the matter, the present Company was gotten up, not with much idea that the shares would be directly profitable, but with the prospect that they might, and the direct object of exploiting Ceylon tea in this country. The money that has been so far paid in has been, or soon will be, used up and unless some decided steps are taken, will be lost. Our friends who are back of us in the proposed new Company say: Why should we bother with the old Company at all? We can buy all the Ceylon tea we want, make our own boards, &c. &c.—and have the whole matter in our own hands, as well as any profit. We have insisted, however, that as we have been your agents, and through you have become interested in the matter, that we would have nothing to do with the business, unless the present Company was merged or in a measure continued in the proposed new one, as we wish it to be a representation *strictly* of Ceylon industries.

Our proposed plan may seem visionary to you, but this is a large and growing country, with an active and speculative population, who are always ready to take up a good scheme on a big scale, and we have with us men who have made a study of introducing Companies such as we propose, and who will give their time, money and experience, with the hope of making their interest in the stock valuable, which of course would be equally shared in by all stockholders. If the Company should succeed, and we think it will, Ceylon tea would be more thoroughly and successfully introduced into this country than by any other means we know of.

Mr. Pineo is fully in accord with the matter stated herein, and as we shall have to commence operations as soon as possible, we will ask your very careful consideration, and would request you to cable us your decision, say "approve," if, as you are authorised by Article 7 of your bylaws, you will give us the option of buying out your Company, for say 12,000 shares of the new Company, we (personally) agreeing that if the new Company is undertaken, that we will take up any shares of parties who may now be stockholders, should they not wish to accept the proposal. —Yours very truly,

(Signed) Wattson & Farr.

1st July 1890.

Messrs. Wattson & Farr, New York.

Dear Sirs,—We addressed you on the 26th ultimo, and have now to report that a meeting of Directors of the Ceylon Planters' American Tea Company was held this day and we were desired to express their obligations to you for the great interest you have throughout manifested in the welfare of the Company and in the introduction of Ceylon Tea into America which have led to the proposals you have made with regard to the new scheme put forward in your letter of 15th March. Whilst recognizing the desirability of carrying on the Company's operations on a much more extended basis than at present, some of the Directors do not regard the position of the Company in a desponding manner and as one liable to end in disaster at an early date as you seem to think, but however this may be, they expressed themselves generally in favour of the scheme and we telegraphed you today "Directors provisionally approve—promotion shares deemed excessive—shareholders called—writing."

The only matter connected with your proposals about which there seems to be a difficulty, is in regard to 28,000 shares to be appropriated to yourselves and the parties who will work with you. There seems to be a difficulty in understanding what the reservation of such a large number of shares as 28,000 is for; what equivalent the Company is to get for such a large allotment which amounts to more than half the proposed capital of 50,000 shares; and we are desired to ask if it is the intention that the 28,000 shares are to be allotted to you for your services in placing the 10,000 shares, the proceeds of which alone will be placed in the coffers of the Company to form its working capital? We understand that you would take up the balance of shares in the old Company that is unallotted, and that you would make yourselves liable to refund to any shareholders in the present Company the value of their shares if they did not agree to the new scheme. We presume it is your intention to expend a large sum of money—and if so about what amount?—in raising the capital and floating the new concern, advertising, travelling &c. in connexion with the promotion of it, and the appointment of local agents, recouping yourselves from what you may obtain by selling some of the 28,000 shares, and not repaying yourselves from the proceeds of the 10,000 shares which will remain and form the working capital of the concern?

We would have been glad to have had an explanation of this from you prior to the meeting of the share-

holders which has been called for the 11th inst., but of course this cannot be. At this meeting it is intended that the Directors shall obtain the permission of the shareholders to amalgamate if they agree to do so; and if they so agree, Mr. Grinlinton, the Managing Director of the Company, who will, as we have advised you, proceed to New York, will be authorized and empowered to discuss matters with you, and to finally conclude such terms as you may mutually agree upon. In short, as the matter presents itself to us, at present the feeling is, that the payment in shares for promotion should be less, and that the number of shares to be sold for the benefit of the Company should be more; otherwise 4-7ths of the share capital will have been paid away or alienated outside the Company, whilst at the same time, dividend is payable upon these shares out of the earnings of a working capital of 1-5th plus the 12,000 shares to be held by the old shareholders of the present Company. We conclude that Mr. Pineo's services would be taken over by the new Company.

Mr. Grinlinton will take a full Power of Attorney with him so that no more time will be lost than is unavoidable, and, as his time will be very limited in America (not more than a fortnight at the outside), it is highly desirable that whatever preliminary steps may be necessary should be well in hand, and all prepared by the time he arrives. He will leave here by the "Parramatta" mail steamer (P. & O.) on 24th instant, expects to arrive in London on the 14th August, and he hopes to leave for America a week afterwards, arriving there about the end of August or within the first week of September.—We are, dear sir, yours faithfully, Darley, Butler & Co., Agents and Secretaries.

The Secretary also again read the telegrams given above.

Mr. Sholto Skrine inquired as to what would be the liability of a shareholder in this new Company. It appeared that a shareholder would have two shares for every original share he possessed.

The Secretary:—He will have no liability whatever: 20 dollars will be the value of the shares.

Mr. Skrine:—But the shares in the old Company will have to be paid up before a shareholder can have the new ones.

The Chairman:—When the whole amount of R50 is paid up those shareholders who wish to remain in the new amalgamated Company would receive in exchange for their one R50 share two 20 dollar shares, at the value of R108, which is taking the present rate of exchange. That would be the limit of liability, and there would be none beyond it, because you receive those two 20 dollar shares for the one R50 share you already hold. There is one other matter I want you to take into consideration, and that is the question as to the advisability of carrying on this Company in the way proposed. Myself and my brother directors think it is the most advisable course, after giving it all the consideration we possibly could, because it is quite open for any other body of men to form a Company and carry on business without us, as Messrs. Wattson & Farr say in their letter. I think our object all through has been to push Ceylon tea and to do the very best we could for it, and I think that if this Company is amalgamated with the new Company as is now proposed, we should not only achieve the object which we had from the first in view—that of pushing our tea, but I see no reason at all why it should not prove a profitable speculation also to the shareholders, as long as the terms are adhered to: *i. e.*, that the value of 10,000 shares is to be kept entirely as the working capital of the Company. It would be open at the same time to any shareholder who wished to withdraw from the amalgamated Company to withdraw from it. He has the option either of receiving two 20 dollar shares for his one R50 share, or he can withdraw from the Company by receiving the amount that he has paid up here for his share. If he has paid up R50, he can withdraw by getting his R50 back.

Mr. F. G. A. Lane:—Will the control of the Company then be in New York?

The Chairman:—Certainly.

Mr. Lane:—Not in Ceylon? Then what assurance should we have that they will buy and sell pure Ceylon tea?

The Chairman said that that was the condition on which they would be made agents, and they agreed to that. In the letter which had just been read Messrs. Wattson & Farr said: "As we wish it to be representative strictly of Ceylon industries."

Mr. Lane:—Will the tea as heretofore be bought in Ceylon, or in London?

The Chairman said that that was one of the minor arrangements which Mr. Grinlinton would make when he went to America, but they would have to make themselves perfectly sure that Ceylon tea alone would be sold.

Mr. Skrine assumed that a large proportion of the 20,000 shares went to the Directors in America, or did the Directors here get any share? (Laughter.)

The Chairman:—No, I am afraid they do not.

Mr. Henry Bois asked if the object of the meeting was to elicit from shareholders an expression of opinion as to whether the proposal should be accepted or rejected, because it seemed to him utterly impossible for a body of men to seriously consider the figures put before them. The point that struck him more than anything else was the enormous proportion which Messrs. Wattson & Farr proposed should be allotted to themselves for promotion money. If he followed the figures correctly it amounted to this:—12,000 shares to be allotted to the present shareholders in the Company in respect of the capital they had subscribed; then they proposed to get 10,000 more shares taken up by the public in America; and they allotted to themselves 28,000 shares—for what?—their services. Did they propose to pay nothing in respect of them, or were they to be 28,000 fully paid-up shares, as promotion money? What it meant was that they, as the promoters of the Company, would have a claim upon the dividends to the extent of 58 per cent, the balance going to the shareholders who had subscribed the capital. He did not think that was a matter they could consider and give an answer to in the course of a few days. He, for one, most certainly was not prepared to commit himself either to an acceptance or rejection of the proposal at that meeting. No information was put before the shareholders, so far as he was aware, until they heard the letter which had just been read, and he thought the matter was far too important for them to come to a decision upon it at the present moment.

The Hon. T. N. Christie said what Mr. Bois had referred to was very much what they had to consider, but it was not a matter of merely granting time that would enable them to arrive at a satisfactory conclusion. What they really wanted was more information. It was hardly credible that a firm like Messrs. Wattson & Farr should propose to them that they should receive as promotion money shares representing nearly a quarter-of-a-million sterling. It was hardly conceivable that they could possibly imagine that they should agree to terms such as those. They used the rather ambiguous expression that they required that money for the floating of the enterprize. If they meant floating the Company he had no hesitation in saying that the request for 28,000 fully paid-up shares was monstrous; if by "floating the enterprize" they meant floating the business of the Company, advertising and pushing the business,

then it might or might not be a reasonable demand. The Chairman had used the expression "promotion money" as applied to those shares, but he could hardly imagine that Messrs. Watson & Farr regarded it as such, and he would take it that when they used the expression "floating the enterprize" they must mean to devote a great deal of time and a great deal of money to the pushing of the business of the Company, and not the mere promotion of the Company. He would point out to Mr. Bois that the one saving clause in the whole of the proposed arrangement which would justify them in provisionally accepting the offer that day, giving Mr. Grinlinton all powers to conclude, was the offer to return their money to those who, when they really learnt what the details were, were discontented, and preferred to have their money rather than to have deteriorated and depreciated shares in a concern which was burdened with having to pay a dividend upon a quarter-of-a-million sterling which had not been devoted to pushing the business of the Company.

The Chairman pointed out that what was stated in this letter was "that 28,000 shares were to be paid to ourselves (Messrs. Wattson & Farr), and the parties who would work with us in raising the capital, and floating the enterprize, and we would all have to give much time and labour to the matter, and advance a great deal of money for advertizing &c., &c., before we could look for any return." One thing he would point out to Mr. Bois was that they were not really presenting Messrs. Wattson & Farr with the value of 28,000 shares, but they had got to raise those shares, and the value of those shares, themselves, and although he used the words "promotion money" he used the word "promotion" as meaning the pushing of the interests of the Company. He did not mean that it was to be handed over to them as a lump sum for simply getting up the Company. The letter, he thought, was fairly clear,—it was for floating the enterprize, which included the advancing of a great deal of money for advertising, travelling &c. It was clearly intended that this money, which they should obtain by 28,000 shares, was to be used for the pushing of the Company, advertising and travelling on its behalf &c. They had to find the money, and probably would have to advance it for some time.

Mr. Skrine asked if they were to understand that Mr. Grinlinton would be in a position when he arrived in New York not to close with them at all if he thought it undesirable, and whether that meeting would only result in handing over the power to Mr. Grinlinton, in whose hands they would put their interests?

Mr. Talbot:—With an expression of opinion.

Mr. Skrine:—I understood that Mr. Grinlinton would have the power of attorney either to close with the Company, or, if he saw fit, to reject the proposal.

The Secretary:—I think you are referring to the terms of the letter which was written on the 1st of the month. A telegram was sent in reply to that, and the reply to that telegram makes it impossible to leave the question open. The telegram says they have considered all points, and if we delay in sending a reply we shall lose the opportunity. I assume that if we decline Messrs. Wattson & Farr will go on with the matter themselves. If we want to make better terms, and wait for a time, the opportunity very likely will have passed from us. As it is we have not got money to go on with very much longer, and then we lose everything. Here we have the opportunity of achieving the object for which the Company was started.

Mr. F. M. Mackwood said that there seemed to him to be two views of this question,—first of all the purely financial view, as it concerned themselves, and the broader view in which they would probably have to be content to sink their personal convenience in the matter as to whether this was the best company and means for introducing and pushing Ceylon tea in America. From the latter point of view it appeared to him to be a great improvement on the powers and scope of the present Company. On the other hand the majority of them had subscribed for a number of shares, and a very great number of them had practically looked upon it as a sort of contribution on which they expected to get no return, merely as their share towards promoting the prosperity of the Company. They did that on the assurance of the working Board of Directors—men whom they all knew, and who were working in their midst. To transfer that work to America, amongst a body of men whom they did not know, and whose figures, as Mr. Bois had stated, were, to say the least, rather staggering, was a different matter, and he was rather inclined to say that if it were not for their offer to give anybody's money back if they did not care to go in for the new Company, that it was a proposal not altogether satisfactory.

Mr. Henry Bois asked if it was intended that that meeting should accept the offer of Messrs. Wattson & Farr, simply giving the power-of-attorney to Mr. Grinlinton to carry out the details of it, or was it intended that he should have authority either to accept or reject the proposal when he arrived at New York.

The Chairman said that the position in which they were at present was that they had to reply to Messrs. Wattson & Farr's telegram. The Secretary of the Company has just stated that the Company would not be in a position to carry on very much longer. It became a question with the shareholders as to whether it was advisable to let slip this opportunity of amalgamation with a large Company to be formed in America, and if they approved of the amalgamation then they would distinctly have to telegraph to Messrs. Wattson & Farr that they were prepared to accept their terms, but qualify it by stating that Mr. Grinlinton would be sent over with power of attorney, deputed as their Managing Director, to go into minor details with them. But he thought that if they attempted to gain longer time, and to put them off in this scheme, that they might just as well give up the whole idea, and he was afraid unless fresh support came in that it would simply mean the closing of the Company. When the Company was originally started with 6,000 shares they expected a very much larger number of shares to be taken up. Stress had been laid both by Mr. Bois and Mr. Mackwood on the large number of shares the promoters in America required. The directors saw that at once; it was the first thing they caught hold of, but it was such a very difficult thing to tackle in a country like America. If Messrs. Wattson & Farr meant that the value of the shares was to be devoted to advertising thoroughly, travelling throughout the country, and appointing agencies in all the small towns, it really and truly was not so very big a sum as it at first appeared, but if it were simply to go into the pockets of the promoters of the Company in America it would be simply monstrous. But in the face of their letter they could not take that view of it. That meeting must come to some conclusion. The letter which had been read was only received on the 18th of June; a directors' meeting was called at once; notice had to be given of

the present meeting, and they had been called together at as early a date as they possibly could be, to discuss the matter and form an opinion about it.

Mr. SKRINE thought the redeeming point about the whole thing was the fact that the American Company were prepared to meet the shareholders here by saying—" If you do not like it we will pay you up." Few of them expected to see their money back, and if the American Company paid them back they would be in a better position than they ever expected to be. For that reason he would suggest that the proposal be accepted and carried through. There was no doubt that the great object of that Company was to push Ceylon teas, not to make money out of the Company, and if they could get people in America to push Ceylon teas for their own interests, even if they did make a good thing out of it, they would indirectly make their fortune.

The CHAIRMAN said it must show confidence on the part of Messrs. Wattson & Farr in their being able to do something, for they need not have offered to pay them back their R50 per share. They could start their own Company, and pay nothing at all. He thought that the very fact of their offering to pay a shareholder a sum equal to R108 for his R50 share, or if he did not care to stay in the Company the money which he had already paid for his share, showed their belief in the company which they were prepared to start. In Ceylon they did not understand the mode of doing things in America. They launched out into enormous advertisements. Mr. Pineo had paid 100 dollars for one advertisement alone—he forgot how many times it was put in—in one magazine. The money was been very soon swallowed up, and if Messrs. Wattson & Farr were going to do the thing as they professed they would do it, and as they sincerely hoped they would do it,—they were a well-known firm—they would have to use a large proportion of those 28,000 shares.

The Hon. J. J. GRINLINTON, said he thought at this stage of the meeting it would be well if he made a few remarks on the subject of the power of attorney for the information of the shareholders. His object in going to America had nothing whatever to do with this Company. He decided on the trip long before that Company had any existence. He went there on his private business, and nothing else, but it was thought desirable by the Board of Directors, as he was a director of the Company, that if he were going to America he should render such assistance as was possible to that Company. His primary object in going was his own private business, and he would very much rather have nothing to do with the power of attorney or anything else connected with the Company, but be allowed to have his fortnight there to run about as he pleased. But having been asked by his co-directors to accept this responsibility—and it was a very heavy responsibility,—he might tell them that he should not accept it at all unless his position was defined, and defined in such a manner that he could not run away from it. He did not want to do anything outside the Company. He wanted to act, if he acted at all, within the decision arrived at, and not to be left with but's and if's and and's, or anything. He must have it stated distinctly what his powers were, and he would not exceed them, but he would much prefer not having anything whatever to do with it.

The Hon. T. N. CHRISTIE said that it might be concluded from what Mr. Kelly had said, which had been more or less supported by the Secretary, that the New York firm were dealing rather generously with them, and that they could have started quite as well without them. That was rather out of it. To the New York firm it was very essential that they should get the same name that they had, and it was obvious that their desire was to secure the *prestige* which attached to the name, and from the patronage which that Company gave. It was their very natural desire to continue that Company, and not go against it. With reference to the remarks made by Mr. Grinlinton it would be obviously impossible for the shareholders to define what he should do in New York. What the shareholders had to do that day was to authorize the Board of Directors to give instructions to him. It was not likely that the conditions would be made known generally that day, and at such a meeting.

Mr. H. BOIS :—May I ask how many shares have been subscribed for in the local Company?

The SECRETARY :—1,747.

Mr. BOIS :—Are there any calls unpaid?

The SECRETARY :—There are 31 defaulters, owing R1,740.

Mr. BOIS :—Otherwise the capital is all called up?

The SECRETARY :—R35 paid up, R10 payable on the 1st of October, and R5 to be called up after that.

Mr. MACKWOOD :—I understand you to say that if we did not adopt this proposal, even with the call that has to be made, we should have to stop in a comparatively short time. It would almost seem, if this is the state of affairs, that we have absolutely no choice, and the proposal of Messrs. Wattson & Farr offers as the only chance of ever seeing any of our money back, for if the Company should stop there are practically no assets that could be converted into capital. It is not as if we had a stock of tea on hand.

Mr. LANE quite concurred in their Company being taken up by this American Company, and of the directors being empowered to accept their terms, but at the same time he thought it should be distinctly stated by their directors, and they should say to their directors that day, that the tea that had to be bought should be bought from Ceylon and not in London, so that they themselves might know what sort of tea it was that was being sold in their name. He thought Mr. Grinlinton should make that a *sine que non*.

Mr. C. S. ARMSTRONG was afraid, in the present condition of the Colombo market, that they would be unable to supply the demand.

Mr. SKRINE said that it appeared to him that they were hardly in a position to carry out Mr. Lane's suggestion that day, because Messrs. Wattson & Farr, as he read the telegram, had told them distinctly that they must either accept the terms offered, or they must let the thing slide. That being the case, considering the circumstances, he thought it was far better to accept the position, and he proposed that Messrs. Wattson & Farr's suggestion be accepted.

Mr. LANE had pleasure in seconding the motion.

The CHAIRMAN said that they had already shipped 32,962 lb., 12,499 lb. of which had been sold, and in shipping that quantity they were not able to obtain all the tea of the description they required in the local market, and had to get some of it in the London market, so that if the proposed American Company were to be a big concern, which they wished it to be, he trusted it would be a bigger concern that the local market could supply, at present at all events. As long as they made it a *sine qua non* that the whole of Messrs. Wattson & Farr's transactions were to be in purely Ceylon tea, he thought they must trust to the honour of the firm.

Mr. GRINLINTON thought it might well be put, as a request from the shareholders, that the Ceylon market—*i. e.* the local market—should be availed of as much as possible. He might mention that on

two or three occasions when they went into the market with samples they had furnished from America, they had been unable to get those teas, and had been obliged to put it off for another season.

The CHAIRMAN also pointed out that the present Company was trading under the auspices of the Planters' Association. Naturally they were only interested in the pushing of Ceylon tea, and if for a moment it were discovered that other than Ceylon tea was being pushed that patronage would be withdrawn at once.

Mr. LANE said he would be content if it were a *sine qua non* that the tea sold should be Ceylon tea, but he agreed with Mr. Grinlinton that it might be a recommendation to Messrs. Wattson & Farr to buy as much as possible in the local market. The inducement offered in the local market at present was not sufficient, so that many planters had to send their teas to London.

Mr. HARRY WHITHAM said that as far as he could see from Messrs. Wattson & Farr's letters they did not desire that the directors should be replaced, and they could buy the tea here. He would make it a *sine qua non* that the tea should be bought through the present directors.

Mr. SKRINE, having formally worded his motion, proposed—"That this meeting authorizes the directors to arrange the amalgamation with the American Company if they are satisfied with the terms offered,"—so that the onus of the thing rested on the directors. (Laughter.)

No amendment being proposed, and no further remarks being offered, the Chairman put the motion, and it was carried unanimously.

The CHAIRMAN then said that having carried that resolution there were some other resolutions which were merely formal. They had been drafted by their legal adviser, Mr. Julius, who had gone carefully through their Articles of Association. The resolutions were as follows:—

I.—That the Directors of this Company are authorised to arrange terms for the sale or disposal of the business estate and effects of this Company to a Company about to be promoted in America for the sale of Ceylon tea upon such terms and in such manner as the Directors shall think fit.

II.—That the Directors of this Company are authorised to delegate their powers of arranging terms for the sale or disposal of the business estate and effects of this Company to any one member of their body and to grant to such member a Power of Attorney to act in America for the other Directors of this Company and for this Company and to arrange and enter into terms for the sale or disposal of the business estate and effects of this Company to a Company about to be promoted in America for the sale of Ceylon tea and to sign all necessary contracts and agreements on that behalf with any person or persons acting for or on behalf of the said proposed Company.

III.—That a Power of Attorney be granted to the Hon'ble J. J. Grinlinton by the Company under sec. 44 of the Joint Stock Companies Ordinance No. 4 of 1861 empowering him to arrange terms for the sale and disposal of the business estate and effects of this Company to a Company about to be promoted in America for the sale of Ceylon tea and to sign all necessary contracts and agreements on that behalf with any person or persons acting for on behalf of the said proposed Company.

These resolutions having been separately proposed, seconded and carried, proxies were handed in, and the meeting concluded with a vote of thanks to the Chairman.

There was one slip made by both Mr. Bois and Mr. Christie—they said that the 28,000 *promotion shares* represented "½ of a million sterling." They were wrong—at twenty dollars each it is £116,000 sterling.—*Secretary.*

PLANTING IN NEW GUINEA.

A DIRECTOR OF A NEW PLANTATIONS COMPANY.

A German gentleman named Mr. Kendt, with his wife and five children, arrived at Colombo on Saturday in the N. L. steamer "Nürnberg." They are at present staying at Mount Lavinia Grand Hotel, and intend to remain in the colony for a fortnight, when they will proceed by the "Preussen" to Singapore, and afterwards to New Guinea, where Mr. Kendt will act as director of the New Guinea Plantations Company. Mr. Kendt, we believe, has really been engaged by the German New Guinea Company to plant cacao and introduce other products. He has been in Trinidad, and besides being a specialist as regards cacao he is what may be called an all-round planter. Coconuts are the principal product of New Guinea at present, but there are also experimental plantations of tobacco, cotton and coffee. With the object of improving the cultivation of these things in New Guinea, and introducing new products, Mr. Kendt will spend most of his fortnight in Ceylon upcountry, visiting various estates of cacao, coconuts, tea, &c. He will probably try the latter on the New Guinea plantations, and the industry generally will receive an impetus on his arrival.

THE AFRICAN FOREST.—Since I have made my map I have taken the trouble to measure the extent of the area covered by this forest, and I find it to be something like 224,000,000 acres; and if we allow each tree 30 feet around for sufficient space, and only forty-eight trees to the acre, we have the colossal figure of 10,752,000,000 as the total number, and if we calculate the plants and saplings of the impenetrable undergrowth we shall be among the incalculable billions.—*Stanley's Address to the Royal Geographical Society.*

PLANTERS AND COOLIES.—A Province Wellesley planter writes to the *Pinang Gazette* to remove misapprehensions arising from the recent discovery of alleged ill-treated coolies on a Chinese estate there. He accounts for the neglect of sick labourers by the fact of Chinese being callous in cases of illness and putting no faith in medicine. He points out that the so-called debt slavery comes to nothing more than requiring coolies to work off the advances, without which they would not ngage themselves, a system authorised by Ordienance. On his showing, employers want more protection than Chinese coolies who, so he says, are more rogues than fools.—*Straits Times*, May 16th.

BRAZIL COFFEE.—There is a considerable touch of exaggeration in a recent report of Mr. Consul Cowper of Santos which has been going the round of the London papers, speaking of São Paulo district—or rather series of districts which find their outlet at Santos as likely to put those shipping through Rio de Janeiro completely into the shade. Last year July 1888 to June 1889, Santos exported 3 million bags; this year 1889-90 the total is likely to be a million short (the alternate crop) or 2 million bags; but Consul Cowper expects over 3 millions in 1890-91 and that the immense districts now being brought into cultivation will soon assure 5 million bags (132 lb. each) and therefore equal to nearly 6 million cwt. But when the worthy Consul values the current crop of 2 million bags or 2,357,000 cwt. at £12,000,000 sterling we can see that he "draws the long bow" or has a good deal to learn about coffee. The day has not come when coffee at Santos can be valued at over 100s per cwt. all round.

BENNETT ON TEA AS INDIGENOUS TO CEYLON. —"Old Resident" writes:—"As it is highly improbable that even as a garden plant the true tea existed at Batticaloa, it does not seem likely that Crawford could have sent Bennett a specimen of real tea in flower, or that Bennett's sketch was made on such a specimen. The strong suspicion is that instead of sketching Crawford's specimen he copied a picture of the true tea plant and then wrote positively of its existence in Ceylon."

JAVA: THE EXPORT OF TEA from Java is officially reported as follows:—

	lb.		lb.
1882 ...	5,900,400	1886 ...	7,385,400
1883 ...	5,852,000	1887 ...	7,026,800
1884 ...	5,572,600	1888 ...	7,477,800
1885 ...	5,328,400	1889 ...	7,682,400

Java does not therefore make much progress as a tea-producing country, and her tea is also of poor quality still, notwithstanding the introduction of late years of good Assam seed, and of machinery for preparation.

IRRIGATION AND SANITATION.—An interesting point in the recent report of Colonel Skipwith on the Irrigation of the North-Western Provinces is the result of a deputation made last January to examine the country between the East Kali Nadi and the Burh ganga, in order to ascertain, as far as possible, the extent the saturation level had been raised by the Fatehgarh Branch Canal, and to report on the measures necessary to relieve the land suffering from swamping. The report, which is now in the Press, ought to be of general as well as special value, for the problem of which it treats is one of the most difficult with which the irrigation authorities have to deal. There are many districts where a succession of dry seasons would bring starvation on the people were they not served with canal water, but where, also, if canals be construoted and there come one or two seasons of excessive rain, the land becomes water-logged, and fever and sickness are stimulated. The construction of canals being necessary, the question is how to keep down the water-level in rainy seasons. The problem is mainly one for drainage experts to settle, but the solution is of the greatest importance to the cultivating community. —*Indian Engineer*, May 31st.

FUEL CONSUMPTION ON INDIAN RAILWAYS.—One of the heaviest items in the working expenses of Indian Railways has been that of fuel and consequently the railway authorities have endeavoured from time to time in every possible way to reduce this expenditure. Mr. C. E. Phipps, the Acting Locomotive Superintendent of the Madras Railway, has recently devised a means of securing economy in fuel expenditure, and his experiments in this direction on three of Sharp Stewart's engines hauling the mail trains during the past few months have been comparatively successful. Mr. Phipps' expedient consists of a small masonry arch of fire bricks of the thickness of three bricks, erected on brass plugs just underneath the last row of tubes of the engine, in the copper fire-box of the locomotive, as also the provision of a double damper. The result of this is that the heat which heretofore passed off quickly is now thrown back by the arch and re-utilised before quitting the engine's fire-box; and as a resultant the consumption of fuel is less. After some further experiments Mr. Phipps it is understood, will take out a patent. But not alone on locomotives has Mr. Phipps' attention been engaged in regard to the consumption of fuel but also in respect of stationary engines at the Perambore Workshops. Hitherto the saw-dust from the saw mills at the workshops was either given away or sold for a trifle. Mr. Phipps is now utilising the saw-dust for fuel in a stationary engine at the shops, and has succeeded in raising with it 80 lb. of steam, a quantity sufficient to work the saw mills there.—*Indian Engineer*, June 7th.

NORTH BORNEO TOBACCO.—The report of the Labuk Planting Company, Limited, to be laid before the first ordinary general meeting of its shareholders at Hongkong on the 5th, stated that 250 fields were under cultivation for this year's crop, which is expected to be large and good, provided the weather prove favourable.—*Straits Times*, May 18th.

NITRE DEPOSITS.—Caves containing deposits of earth with from 4 to 30 cent. of calcium nitrate and 5 to 60 per cent. of calcium phosphate are common in Venezuela not only in the littoral mountain chains, but also on the flanks of the Cordillera of the Andes. In these deposits are embedded remains of mammalian bones, preserving their form, but so friable as to fall to powder when they are extracted. They consist solely of calcium phosphate; the gelatine has been nitrified and dissolved out, and the calcium carbonate of the bone has been used up in neutralising the nitric acid produced. The nitric ferment is found in abundance throughout the deposits in a very well-developed form. Some of these deposits are ten metres thick.—*Jour. Soc. Chem. Ind.*

COTTON GROWING AMONGST THE DON COSSACKS.—The persistance with which Russia struggles to make the country self-contained and the people a self-sustained one is a phenomenon which has long been noted, and to the permanence of which contributory evidence of the most recent date is seldom wanting. Our Consul at Taganrog reports that trials were made during the past year's season for growing cotton in the Don Cossack territory, and, as the results received were very favourable, further experiments will be made by members of the Agricultural Society during the present year. It thus appears that Russia has by no means abandoned her intentions in these districts of her widely extended territory.—*Textile Mercury*.

CALEDONIAN BALSAM.—At a recent meeting of the French Société de Thérapeutique, Dr. Forne called attention to the advantages presented by a preparation that he had named "baume calédonien," and which appeared to consist of a solution of Kauri gum in an equal weight of 90 per cent alcohol. He stated that it had been used with great success in the treatment of wounds and ulcers of all kinds. When applied to a well cleansed and dried wound it causes a very slight, but brief sensation of burning, but after a few moments the solvent evaporates, and the resin is left as a very adherent varnish, which is not affected by friction or contact with water. The preparation can also be used advantageously for fixed bandages in the place of the soluble silicate. It was also said to be superior to tincture of benzoin for the obturation of the cavities in carious teeth. Lastly, a liniment made with equal quantities of baume caledonien and olive oil was recommended as an application to burns.—*Oil, Paint and Drug Reporter*.

NOTES ON AGRICULTURE IN BALASORE.—*Wild Paddy.* —Mr. Cleghorn presented a drawing of wild paddy, which is very common in Orisa where it constitutes a serious evil. It flowers at the same time as the cultivated kinds, and appears to cross fertilize them to such an extent, that in a few years the cultivators have to import fresh stock from other districts. The wild paddy is not readily distinguishable from cultivated kinds in appearance, but it sheds its seeds so readily that it cannot be harvested; and this peculiarity is imparted to the kinds which it cross fertilizes. When importing fresh stock the cultivators select kinds with stems of a different color to that which they had in cultivation. Thus assuming that a light colored stem paddy has been cultivated, and deteriorated from cross fertilising; the stock chosen is dark stemmed, when this in turn deteriorates, light stem kinds are reverted to the difference in color being of material assistance in weeding out undesirable kinds. As Mr. Cleghorn has left Balasore, members on the spot will be asked to further investigate the subject.—*Agricultural and Horticultural Society of India.*

A FEW PRACTICAL SUGGESTIONS CONCERNING QUININE.

BY PROFESSOR DR. C. BINZ OF BONN.

The study of the employment of qninine in uncivilised fever lands leads to the conclusion that in such countries it is to the traveller as essential as gunpowder. The one he must have to protect his existence and property against greedy and treacherons native chiefs, and the other to secure his life against the malaria fever.

G. Schweinfurt relates that he rendered himself proof against the effects of a prolonged sojourn in pestilential swamps by the fortifying influence of qninine taking ½ gramme* three times a day. It was an extreme case. For by the very nature of his occupation, namely, botanising in the swamps and wading among the papyri, he was completely exposed to the malaria, and constantly inhaling its fatal breath. Nevertheless his health remained unimpaired until by return to the pure air of the interior he was enabled to dispense with the further use of quinine. (Im Herzen von Africa. Reisen and Entdeckungen 1874 I. 137 und 352.)

In his work "Through the Dark Continent," H. Stanley tells us how three attacks of fever reduced him seven pounds in weight. But he "quininized" himself thoroughly from dawn till sunset, and came out on the fifth day pale, weak, trembling, with jaundiced eyes, beating heart, and singing ears, but the fever was overcome. And in his book on the Congo he speaks of another fierce attack of fever which he also conquered by large doses of three, and three and a half grammes of quinine, together with a few drops of hydrobromic acid and a little Madeira. He felt the strong medicament stream like lightning through his veins, and gradually creep with overwhelming force over his senses. But twenty our hours sleep followed, the fever was gone, and though terribly reduced in strength he was able to slowly recover.

C. Nachtigal briefly terms quinine "the greatest of treasures to travellers in tropical regions."

I give the above as only a few voices among countless others. Respecting the value and importance of quinine, the evidence is vast and unanimons.

It teaches us that in preparing for a journey to fever-stricken lands, quinine should be obtained in the very best, purest, most effectual form. This is however very rarely the case. The consequence is that the most serious risks are constantly incurred. Travellers and officials even lose their lives, or have to change their plans, or give them up altogether. To remedy this so far as lies in my power, I beg to submit to you (Deutsche Colonial-Zeitung) the following observations. They are the result of years of constant practical and experimental study of the subject.

The two chemists who first produced quinine from the Cinchona bark, did so in the form of the sulphate, and probably more by accident than intention. At all events in that form quinine passed into commerce, and so has remained for the last fifty years. Most physicians from habit and custom know and prescribe only the one salt; most pharmacopeoias even know no other, and in the last Prussian, it also remained the only recognised form of quinine, until on my proposition, the hydrochlorate was also included in the German pharmacopoeia of 1872. Since then the consumption of the hydrochlorate has gradually increased, but still remains considerably smaller than that of the sulphate, about 1,750,000 oz. of the former being consumed in the world, against about 5,250,000 oz. of the latter. There are civilised countries, as North America for example, where even now the sulphate is exclusively in vogue.

Without being a chemist, one can easily understand the difference between the two kinds, remembering their difference in solubility in water. The sulphate demands about 800 times its weight of distilled water to dissolve perfectly, whereas the hydrochlorate requires only 50 times.†

* About 7¾ grains.—ED. *T. A.*

† 23 grains.—ED. *T. A.*

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By the addition of a little free acid the solubility is increased, but also in such case greatly in favour of the hydrochlorate over the sulphate. What is the consequence? As long as the human stomach is in a healthy condition it developes of itself free hydrochloric acid sufficient to change even the sulphate of quinine into that form in which it can be more readily assimilated. But whenever the stomach becomes subject to disorders involving the diminution, or even total disappearance of such natural acid, the power of solution and assimilation of course terminates, and the medicament that by reason of its low specific gravity is very voluminous, remains as so much worse than useless ballast in the already weakened stomach. This is one reason why so many lives are lost annually notwithstanding administration of quinine. It is clear that with the sixteen times greater solubility of the hydrochlorate, the risk of its remaining inoperative in the stomach is considerably diminished. In numerous cases the hydrochlorate will dissolve and enter the blood, while to the sulphate this is impossible. It is precisely its insolubility in weakened stomachs that explains why in so many cases of fever, the otherwise so potent and reliable quinine is absolutely useless. The quinine passes for the most part into the lesser intestine where the conditions for assimilation by the blood are the more unfavourable, since the reaction here is purely alkalic, rendering solution even more difficult.

The addition, or the drinking afterwards of any acid beverage that is otherwise suitable or congenial to the stomach, of course greatly tends to facilitate the assimilation of the quinine. Stanley was quite right in taking hydrobromic acid and Madeira. The former, however, that is in general difficult to procure, and an acid moreover that readily decomposes, was not absolutely necessary. Diluted muriatic acid would have done equally well, or any agreeable fruit acid. All good spirituous drinks are also energetic solvents of quinine. Such however are not always obtainable when travelling in fever countries, or for other reasons may not seem advisable to administer. In such case, the best of all aids is strong carbonic acid water. One should, however, take with one that preparation of quinine which in all cases is the most easily assimilated, and that is the hydrochlorate.

Up till within the last few years impure or even intentionally adulterated quinine often changed hands in commerce. A criminal suit in Berlin in 1886, and another in Paris in 1883 on account of such adulterations created some sensation at the time. The most frequent surrogate were the subsidiary alcaloides of the Cinchona bark that are much cheaper than quinine itself, but also much less effective against the Malaria poison. Things in this respect have grown better, the more so since quinine has seemingly fallen permanently from the high price to which it was driven by speculation. Yet whoever visits the interior of Africa must not rely simply upon the improved quality of quinine. He must obtain his supply from the best sources and even then submit it to the prescribed tests.

Much has been lately spoken on the question whether quinine has a preservative influence against fever. It is obvious that this question is of the greatest practical importance. In my opinion the matter lies thus.

In consequence of imperfect trials, one came to the conclusion that quinine exercised no really prophylactic influence, and this opinion was accepted and promulgated by certain careless editors of medical handbooks. In reality, however, too little quinine had been administered, or if enough, in inappropriate form. Other physicians who had examined the matter with more care and attention met with better results quite in accordance with Stanley and Schweinfurth's own personal experience. I am inclined to lay the more stress upon this, since the errors in treatment referred to can be easily recognised. Fresh experiments have been recently made by Dr. C. Graeser who published the results in the Berliner klinische Wochenschrift 1888 No. 42. As navy-surgeon in the Dutch service he had ample oppo-

tunity of studying the question at the notorious fever port Tandjong Priok near Batavia. His experience completely asserts the prophylactic, or preservative effect of quinine, and is moreover confirmed by that of his successor, as I learn by personal communication from him. Every time his ship arrived at Tandjong Priok, Dr. Graeser gave every one of the crew one gramme of quinine dissolved in geneva, and repeated such dose on the 8th, 12th and 16th days after arrival, administering also on the intervening 10th and 14th days half a gramme. His successor Dr. Buwalda varied the treatment somewhat. Already three days before arrival at the port named, and also during the whole sojourn on the coasts of Java and Sumatra, a period of five weeks, every man received a gramme of quinine three times a week. The quinine was likewise dissolved in geneva. With Graeser the interval between the first and second dose was somewhat too great. His successor by shortening the term obtained also better results. The geneva was employed chiefly with a view to inducing the sailors to submit to their regular dose of physic. With educated patients the use of alcohol might be dispensed with, provided that a moderate quantity be not demanded by weakness of the digestive organs.

Unless the country to be inhabited, or passed through is not altogether too pestilential, two doses of quinine a week may be sufficient. The effects should however on no account be frittered away by too small doses. All reports before me teach the uselessness of that, and the scientific view confirms it. On the other hand one need have no fear of any injurious consequences from such doses as those prescribed by Dr. Graeser and Buwalda. The evil effects often attributed to quinine should be rightly ascribed chiefly to the illnesses against which it is taken, or to unsuitable methods of administration. In these must be included, as beforesaid, the passing of the insoluble sulphate into a weak stomach, and in no better medium than a volume of water.

Springwater is almost always employed and of this, according as it is impregnated with lime and other substances, much more than the 800-fold volume will often be found necessary to get the quinine to dissolve.

That the prophylactic or preservative effects of quinine have their limit, is a matter of course, and we expressly mention it here in order that the failure of exaggerated expectations may in no wise affect our faith in what is really feasible. Whoever lives permanently under the influence of intense malaria may at last find the further employment of quinine impossible, since after all it is a substance foreign to our organisation, even though yet more hostile to the malaria poison. Like other things quinine is limited in its effects. Water is an excellent means of extinguishing fire, yet may be powerless against a conflagration, and though wool is a good preservative against cold, one may perish in the thickest clothes.

The well known fact in the present day that the malaria poison proceeds from decay of vegetable matter, and is itself in reality a species of lowest organism that affects us by penetrating into the blood, renders the preservative action of quinine perfectly intelligible. For if such organism on reaching the blood encounters that chemical substance to which it is especially sensitive, its developement and increase is arrested, and the consequences that would otherwise follow, fever, swelling of the spleen, disintegration of the blood are prevented. Quinine is not as formerly supposed, simply a tonic to the nervous system enabling better resistance to disease; only indirectly does it exercise such bracing effect.

No value should be attached to the many medicaments recommended as substitutes for quinine in cases of fever. Not one of them is at all equal to it in efficiency. Only arsenic can be sometimes substituted with advantage, whether however it can be so in general, and under such fluctuating conditions as a journey in wild countries carries with it, is unknown to me.

Hydrochlorate of quinine is somewhat dearer than the sulphate. In one of the latest pricelists I find the former given as costing 2/8 and the sulphate 1/8 the ounce. The difference is owing chiefly to the factories being arranged principally for the production of the sulphate on a large scale, and the hydrochlorate involving a further process. To the consumer however the difference in price is almost neutralised by the larger contents in the hydrochlorate of the pure alcaloid, 83 parts being contained in the hydrochlorate against only 74 parts in the sulphate. An equal weight of the hydrochlorate goes therefore much farther, apart from its greater solubility and easier assimilation by the stomach. Lastly the hydrochlorate of quinine is much more rarely adulterated than the sulphate.

GERMINATION OF SEED.

It is a common mistake to suppose that in order to produce a mature plant we must allow the seem to germinate, aud the resultant plantlet to fix itsed in a soil and draw nutriment by means of roots frolf mother earth. Any plant will grow as well in water if it contains the proper food stuffs in the proper quantities, as it will in soil of the very richest and most fertile kind. All that has to be done is to germinate the seed on a piece of moist flannel, and then transfer it to a jar containing to every litre (about 1¾ pint) of water the following quantities of the following substances:—1 gramme of nitre; ½ gramme of each of the following—sulphate of lime (plaster of Paris) sulphate of magnesia (Epsom salts), and phospate of lime. An iron nail must also be kept in the water to give to the plant the almost infinitesimal amount of iron which it requires. This mixture of water and salts must be renewed about once a fortnight. Of course the root portion only of the plantlet is to be immersed in the water; the stem part which bears the green leaves must be allowed to stand out freely into the air. In Germany it has been the custom for many years to set aside some portion of the botanic garden for the growth of plants of all kinds, from the smallest herbs to the loftiest trees, in food solutions of the kind described above, *i.e.*, by what is commonly known to botanists as the system of water culture.—*Indian Agriculturist.*

A NEW BAMBOO.

(Bambusa palmata, hort.)

One of the most noble and distinct of all the Bamboos, so far as its foliage is concerned, is one sent to us under the above name by M. Marliac, the well-known specialist of Temple-sur-Lot (Lot-et-Garonne), France. Without flowering material, Bamboos are exceedingly difficult to make out specifically; but so far as leafage goes, the plant resembles Guadua or Dendrocalamus latifolia, as illustrated at plate vi of General Monro's *Monograph of the Bambusaceæ.*

So far, B. Ragamouski has been our largest-leaved species, but B. palmata has much finer leaves, and is more erect in habit. As sent by Mr. Marliac, the stems are 5 feet in height, with from five to seven leaves at their apices only; the largest of these leaves are 12 to 13 inches in length by 4 to 5 inches in breadth at their widest part. The figure (106), shows the stems and the leaves about one-third of their natural size. Above, the leaves are of a rich yellowish-green tint, finely lined or veined and below they are of a soft blue or glaucous hue. The plant is said to be hardy, but even if it should not be so under all circumstances, the plant is so noble and distinct in habit and leafage that it is well worth pot or tub culture in the greenhouse or conservatory.

It would be very interesting if the growers of Bamboos in continental gardens would tell us something as to the species and varieties they cultivate. Again, how many species are there hardy in Great Britain and Ireland? My own experience with about a dozen kinds is, that they will withstand a good deal of cold weather and actual frost, but that they will

uot endure drought or dry scathing winds. In moist rich soils and sheltered positions they grow rampant, and add a grace to ordinary shrubs that no other hardy exotics can do.

Again, I should like to ask whence and from whom may seeds of Bamboo be obtained? The seeds germinate so readily, and, as General Munro pointed out in 1866 (*Trans. Linn. Soc. Lond.*), the young plants grow so rapidly that it seems a pity the hardier kinds of North China, Japan, the Himalayas, and the Andes cannot be reared in quantity.

Where is Arundinaria macrosperma of the Southern States of America now cultivated in Europe? One of the most distinct of all the dwarf kinds is one from Japan growing 2 feet high. Its leaves are about 3 to 5 inches in length by 1½ inch in breadth, and it acquires a variegated aspect from the withering and bleaching of the Margins of its leaves. Can anyone tell us the name of this peculiar species?—F. W. Burbidge. [Bambusa tassellata, hort., see p. 578.]—*Gardeners' Chronicle.*

LIBERIAN COFFEE, VANILLA &c.

Experimental cultivation has been carried on for some years at the plantation at Mergui in Burmah, but according to the report of last year, it cannot be said to have achieved much success. Liberian coffee was fairly successful, though the plants were attacked by white ants, and the crop was less than in the previous year. Great difficulty has been experienced in introducing the coffee for sale, as the first year's crop which was sold to a Burman was not properly prepared, and some persons declared that it was not fit for consumption. When the present Sub-Assistant Conservator of forests took charge he suggested that the coffee should be prepared by the department itself and sold locally, which was done; and though at first there was some difficulty in finding purchasers owing to the bad name acquired by the produce of the previous year, it was gradually sold off, and the purchasers were all pleased with its flavour. The crop of last year at once found a ready sale at R1-8 per viss, and the supply was not sufficient for the local demand, the coffee being pronounced much superior to that sold in the bazaars. The experiments with Arabian coffee proved a complete failure, and have been abandoned. The cocoa seedlings and plants suffered severely from the attacks of white ants, so that only twenty remain of 161. Only two of these produced pods, which have not as yet been collected. The vanilla plants grew well and flowered, but the flowers all died without coming to maturity owing to the absence of insects to disseminate the pollen, but an attempt is now to be made to fertilise the flowers by hand. There were 172 tea plants, but nothing is said about their produce, and the four cardamom plants all died, while specially selected seed sent from Mysore did not germinate. As the total receipts from the sale of produce amounted to R.272, and the expenditure to R617 it cannot be said that the experiments have proved profitable; but as the plantation only cost such a small sum it is to be continued.—*Indian Agriculturist.*

MORE TEA DEALERS PROSECUTED.

(*Special Report for the "Ceylon Observer."*)

At Greenwich Police Court, on Saturday, 21st June, George Westover, grocer, of 247 Lewisham High Street, and Kearley & Tonge, trading as tea merchants at Mitre Square, Aldgate, appeared before Mr. Marsham in answer to summonses under the Merchandise Marks Act, charging them with having sold or caused to be sold certain tea to which a false trade description had been applied, contrary to 50 and 51 Vict., cap. 28. Mr. Albert Gray, instructed by Messrs Sanderson, Holland, and Adkin, appeared to prosecute, and Mr. Asquith, Q. C., instructed by Messrs. Lewis and Lewis, defended Kearley and Tonge.

Mr. Lickfold asked that the case against the defendant Westover might be postponed, on the ground that the summons had only been served on the previous day. Mr. Gray said he had understood that the summons was served some time back, as the information was laid on 6th June. However, if the case against Westover was postponed, he would ask that the case against the other defendants should also be held over, because the former case should come first in order of priority. Mr. Asquith remarked that it was clearly the intention of Mr. Gray to use the conviction he hoped to get against Westover as a means of putting the screw on in the case against the other defendants.

Mr. Gray explained that the Act distinctly provided for what his learned friend termed "putting the screw on." And the charge against Westover would never have been brought if he had only availed himself of the means of exemption provided. By a special clause the retailer was exonerated from blame if he could prove "that on demand made by or on behalf of the prosecutor, he gave all the information in his power with respect to the persons from whom he obtained such goods or things." This the defendant had been asked to do but had refused, and the prosecutors had been reluctantly obliged to proceed against him.

Mr. Marsham said that as the summons had not been served until the day before he thought that the request for postponement was very reasonable and he must grant it. He thought the case against the other defendants might very well be proceeded with at once. In reply to Mr. Gray His Worship added that he had no objection to the admission of the defendant Westover as a witness provided there was no objection by defendant's counsel.

Mr. Asquith:—My friend Mr. Lickfold may have something to say on that point presently.

Mr. Gray, in opening the case against Kearley & Tonge, said the prosecution was instituted by the Ceylon Association in London. It was not a trading body, but an association of gentlemen connected with Ceylon formed for the purpose of protecting the interests of the Island.

Mr. Marsham:—I understand, then, that it does not represent any particular firm in this case.

Mr. Gray:—Certainly not. Counsel proceeded to quote the sections of the act under which defendants were charged, and referred to "Storey *v.* the Chilworth Gunpowder Company" and "Wood *v.* Burgess," two cases that had been decided in a superior court, as bearing some interpretation of the act that was of value in the present case. The defendants Kearley & Tonge were tea blenders, and they supplied tea in packets to a large number of retailers. The tea in question (packets produced) was described on the label as being from a "Blackmoor Vale Estate." On the upper surface of the label were the words "imported by Kearley & Tonge" followed by "Pure Ceylon Tea." By paying close attention to the label, and perhaps with the aid of glasses, the words "Blended with India and China" might be discovered, but they were so hidden by a signature of "Kearley & Tonge," one flourish being scrawled heavily through them, that the words denoting a blend were certain to escape the eye of the purchaser. The packets in Court were bought of Mr. Westover, a grocer, and the tea had been analysed by professional men of the highest standing in London, who said that it was not Ceylon tea at all. If there was any Ceylon tea in the packets it was so small a part of the whole as to be undiscoverable. If that could be proved to the satisfaction of the magistrate, the question was whether the description upon the packets was a false description within the act, and whether that description was false in a material respect and such a false description as the Act was passed to prevent. It seemed to him (Mr. Gray) that that was clearly so. On the face of it, it was indicative, when they looked at the label on the packet, of the fact that the tea was the pure Ceylon tea. For while the words "Pure Ceylon Tea" were in large clear type, the words denoting that the tea was a blend were not only in very small type, but were practically scored out. This was indicative of a design to deceive, for the latter words were quite imperceptible to the ordinary purchaser. What was the impression on the mind of a person who asked for Ceylon

tea? He would get one of those packets given to him, and the question was whether he ought not to suppose, from the visible description on the label, that he was buying pure Ceylon tea, unless he was actually told at the time that the tea was a blend. When the word "pure" was used with the word "Ceylon" in important-looking letters across the front of the label, he (counsel) would submit that the sellers were not entitled by means of words tucked away and concealed to be exonerated from blame if they sold a blend to the purchaser. When it was considered that the description on the label was not the effect of accident but of design, he felt that a conviction was bound to follow. He would point out that it was not a question of infringing the trade mark of anybody; that was an altogether different charge. The analysts and professional experts to whom the tea had been submitted would pronounce it to be composed principally of Indian tea, with very little China, and hardly any, if any, Ceylon.

Mr. SKIRROW was then called and examined by Mr. Gray. He said he was a traveller for a firm called the Ceylon Tea Growers, Limited. On 24th May he had purchased packets of tea at Westover's shop in Lewisham High Street. He had sealed four packets in the presence of a witness; the packets were all closed when bought. He then took two packets to Mr. Leake, Secretary of the Ceylon Association; one he handed to his witness, and the fourth he retained.

Mr. WM. MARTIN LEAKE, examined by Mr. Gray, said he was the Secretary of the Ceylon Association in London. He had received, some time after May 24th, some packets of tea from the previous witness; and samples of that tea were handed by him to the experts for testing.

Mr. GEORGE STEHN was then called, and said that he was manager of Messrs. Wilson, Smithett & Company's tea rooms at 41 Mincing Lane. In answer to Mr. Gray he said his experience extended over 13 years. On 27th May Mr. Leake brought a packet of tea to his place of business, and gave him some of it. He submitted it to the usual tests and tasted it. He found it to be a blend principally composed of Indian tea, with a little China. It was possible that there might be some Ceylon in it, but if so it was very little. He had been to Ceylon.

Mr. GRAY:—Do you know of the existence of a Blackmoor Vale Estate in Ceylon?

WITNESS:—There is no such estate there.

Mr. ASQUITH:—We don't pretend that there is.

IN CROSS-EXAMINATION witness said that more than a tea-spoonful of tea was used in testing. Asked as to the method of testing, witness explained that it was done in the usual way—by pouring boiling water on the leaves and tasting the liquor, and by smelling the leaves both before and after infusion.

Mr. ASQUITH:—But do not Ceylon and Indian teas belong to the same class or family?

WITNESS:—They have marked characteristics of their own. There is a great difference in flavour.

Mr. ASQUITH:—That is strange. Are you sure of it? Yes; you wouldn't think it strange for there to be a difference between the flavours of a glass of sherry and a glass of port.

Mr. ASQUITH:—Do you mean to say that there is as much difference between Ceylon and Indian teas as between sherry and port?

Yes; the difference would be as apparent to a practical tea-taster.

Continuing, witness said that the price of the lower grades of Ceylon tea was about 2d higher than that of the corresponding grades of Indian in the market. It was one of the lower grades of Indian tea that had been used in the packets in question. The flavour of China tea was very different from either Ceylon or Indian. Pressed for his view as to the actual proportion of Ceylon tea in the packet, witness said that it might be as high as 5 per cent; but in his opinion there was not so much.

Mr. ROBERT ANDERSON was examined by Mr. Gray, and said that he was manager of the Indian and Ceylon tea department of Messrs. Arthur Capel & Company. Mr. Leake came to him on the previous ay with a packet of tea, some of which ho gave him. Witness turned it out and weighed it up, and then submitted it to the usual test and tasted it. His opinion was that the tea was mostly Indian with a little China. He could not find the least trace of Ceylon in it. He was engaged in tasting tea every day, and he might say almost every hour of the day. His taste would naturally become acute with so much practice.

BY MR. ASQUITH.—There was no difficulty whatever in distinguishing between Indian and Ceylon teas. He would certainly be able to detect the presence of Ceylon in the mixture unless the quantity used was quite insignificant. There was China in it—an appreciable dash; but no appreciable quantity of Ceylon.

GEORGE WESTOVER was called and examined by Mr. Gray. He said he carried on business as a grocer at 247 Lewisham High Street, and remembered Mr. Skirrow calling on 24th May and buying some tea.

Mr. LICKFOLD here asked the Magistrate to caution the witness not to say anything that would incriminate himself. There was a summons hanging over him, and it would not be right to allow the witness to prejudice his case.

After a short consultation the summons against Westover was withdrawn, Mr. Marsham remarking that he should be unable to compel him to answer questions in the witness-box unless that course was adopted. (Examination continued.) Asked where he obtained the tea in question, witness refused to answer the question, but ultimately said he got it from Kearley & Tonge. He went personally to their place for it; sometimes he brought the goods away with him. The teas complained of were sent down to him, however. The order was given at the firm's house, and the terms were cash; the money being paid at the time when the order was given. He had no credit for tea. The price paid was 1s 5d per lb., and he sold it at 1s 10d. The carriage of the tea was paid by Kearley & Tonge.

MR. GRAY:—Do you sell it as Ceylon tea or as a blend?—I sell it as a blend.

BY MR. ASQUITH.—He bought it at the office in Mitre Square in the city of London, and paid for it there. It was delivered to him in Greenwich at 1s 5d. Asked, "Did Mr. Skirrow ask for Ceylon tea?" witness said he was not in the shop at the time, but there were other witnesses present who could give evidence on that point.

Mr. ASQUITH, addressing the magistrate, said that the sale having taken place at Mitre Square, the offence, if any, was not committed within the jurisdiction of the court. He should be very sorry if this was so, because he felt that it would be much more satisfactory to have the matter disposed of by a learned magistrate than by an alderman of the City; and in this he was sure he expressed the sentiments of his learned friend as well as his own. But his only fear was that if a conviction was obtained it would not stand.

Mr. GRAY contended that the sale did not take place outside the jurisdiction of the court. The goods were sent in defendants' own van, and the sale was not completed until the tea was delivered at Greenwich, the price paid including delivery.

Mr. MARSHAM supported this view, remarking that he thought Mr. Asquith would not deny that if the tea had been damaged in transit Westover would have had a claim upon the defendants.

Mr. ASQUITH admitted that there was some force in the argument, and said that as the magistrate held that he had jurisdiction, he would gladly proceed with the merits of the case. He contended that the label on the packets was not a false trade description. It truly described the contents of the packets. No one was entitled to expect from the description that there was any large and appreciable quantity of Ceylon tea in the blend.

Mr. MARSHAM (interposing):—Well, one would expect that the *majority* was Ceylon, would he not?

COUNSEL, continuing, said that the experts had declared that there was no difficulty in deciding the proportion of Ceylon in the packets. It seemed another instance of the unreliability of expert evidence. He intended to shew by the books of the defendants and by evidence that there was a very

large proportion of Ceylon tea in the blend. His clients never bought China tea.

Mr. MARSHAM:—Then why do they say on this packet that it is "blended with India and China"? (Loud laughter.)

Mr. ASQUITH:—I shall come to that later on. Proceeding: Counsel said the tea was really a mixture of Ceylon and Indian. Of course, the quantity of Ceylon used varied from time to time. But it was always as much as 40 per cent of the whole and sometimes rose to 80 per cent. Ceylon and Indian teas did not differ so much as one of the witnesses had stated. The first named was used to give greater body to the blend, and to suit the palate of the consumer. In the tea before the court the Ceylon preponderated. The experts had differed somewhat from each other. In fact on one point their evidence was irreconcilable, for while one said that he could discover no Ceylon tea at all, the other had admitted that there was perhaps as much as 5 per cent. But assuming that he (Mr. Asquith) could establish that what he had stated about the contents of the package were the facts, where was the false description? Counsel for the prosecution had somewhat exaggerated the difference in the size of the letters on the label. Ceylon tea was a recent introduction which had attracted public attention; his clients would not deny this, and they naturally had the more attractive name printed in rather prominent type. It had been said that the signature of the defendants was made to hide the words signifying a blend. But he could prove that the signature was really the usual one adopted by defendants, and that the flourishes were genuine. Gentlemen in the city were often fond of adorning their names with long strokes and curls (laughter), and this was one of that kind. Now as to the words "Blackmoor Vale Estate": it was never intended that they should be understood as implying that the tea was grown on an estate of that name. Everybody knew that Blackmoor Vale was a charming spot in Wiltshire, famous for hunting. No one ought to be better aware of this than the gentlemen interested in that case, whom he suspected of a weakness for sport of that nature. (Laughter.) The words "Blackmoor Vale Estate" were registered as a trade mark by defendants before the Act was passed, and he could prove this by producing the certificate. It was purely a fancy description; and although he would admit that it was a rather eccentric form of trade mark, he denied that it warranted any assumption of fraudulent intentions. He would proceed to call his witnesses.

At this point Mr. MARSHAM said that it would be impossible to finish the case in the time at their disposal, and it was adjourned for further hearing on Saturday, 28th June, at 12 o'clock.

On Saturday, 28th June, at Greenwich Police Court, Kearley & Tonge, Tea Merchants, again appeared before Mr. Marsham in answer to a summons under the Merchandise Marks Act charging them with having sold certain tea to which a false trade description had been applied. It will be remembered that the case was partly heard last week and was then adjourned.

Mr. GRAY again appeared to prosecute, and Mr. Asquith, Q.C., for the defence.

Mr. HUDSON KEARLEY was called and examined by Mr. Asquith. He said he was a partner in the defendants' firm, who dealt largely in Ceylon and Indian teas. Ceylon tea was introduced into the English market about five years ago. That was the first time that any considerable quantity of Ceylon tea came to this country, and his firm began to deal in it at once. They had a label designed and made bearing the words "Pure Ceylon Tea," but without any reference to its being a blend. The signature running across the label was an exact facsimile of the signature of the firm signed by himself, and the flourish to which attention had been called was a customary part of that signature.

Mr. MARSHAM:—Was the flourish usually made so far away from the name as it is on this label?

WITNESS:—Yes; I can prove it by producing some of the firm's cheques (cheques handed to the Magistrate.)

Mr. MARSHAM remarked that the flourish was not quite the same as that on the label, where it extended farther beyond the name than it did on the cheques.

WITNESS explained this by saying that when the plates for the labels were engraved the signature contained also the name of a Mr. Heseltine. On his leaving the firm his name was erased from the plate, but the flourish remained unaltered. The signature was on the label at the time when it was used for pure Ceylon tea and nothing else. Referring again to the commencement of his firm's dealings in Ceylon tea, witness said that in course of time they came to the conclusion that it was coming down in reputation and in quality, and they formed the opinion that it would be improved in flavour by blending. They therefore mixed with it Indian tea, and had words added to the label signifying that the tea was a blend. The only difference between the original and the later labels was the addition of the words "Blended with India and China." The tea had always since that time been Indian and Ceylon, and the firm had never sold tea with that label attached of which Ceylon did not form a part. Although the label said "India and China," China tea had never been used in the blend. The word "China" had been added to the new label with a view to putting China tea into the packets if it should ever sufficiently improve in quality and rise in public estimation. But that eventuality had not yet happened. In evidence of this, witness quoted statistics showing that although the quantities of Indian and Ceylon teas imported had largely increased, the imports of China tea had gone on steadily diminishing.

Mr. MARSHAM said he wondered that the defendants should have put the word "China" on the label if they did not fully intend to put China tea into the blend.

WITNESS explained that they had not used China because Indian had always been better value in the market. He had not personally taken any part in the actual blending since 1888; prior to that year he had supervised it. Asked for his view as to the market difference in the prices of Indian and Ceylon tea, witness said it was nothing like twopence per pound in favour of the latter. Such a statement was simply ridiculous. The prices varied from time to time according to the issue of the market governed by supply and demand. For instance, if the Ceylon crop were inferior, it would have the effect of making Indian tea dearer in the market. Prices were constantly fluctuating and were not steadily in favour of either Indian or Ceylon. There was always a sea-saw movement. To say that prices were always in favour of Ceylon tea was altogether untrue; in fact, until quite recently the very reverse had been the case, the average prices of Indian tea being above the average prices of Ceylon. At that moment, however, the relative prices were in favour of the latter; this having been so for some weeks past.

Mr. GRAY, interposing, said it was not claimed by the expert Mr. Stehn that there was a uniform difference of 2d per lb. between all Ceylon and Indian teas; he had stated that this difference existed only between the low grades.

Mr. ASQUITH thought not; but on reference being made to the notes of the evidence given at the previous hearing, Mr. Gray was found to be correct.

Continuing, WITNESS said his firm also sold tea under the "Ceylindo" brand.

Cross-examined by Mr. Gray, witness stated that the "Blackmoor Vale Estate" label was registered in 1886. That might be the year in which the Indian and Colonial Exhibition was held in London, but he did not know. Pressed on the point, he said he supposed there had been such an exhibition about that time; it was no concern of his to try to recall the exact date. The signature was on the label when sent for registration, but it had to be taken off because the authorities refused to register signatures. Defendants had used no China tea in the "Blackmoor Vale" blends. They rarely bought China tea: probably once in three months. But it was never used in blends of which Ceylon tea formed a part, only in cheap blends sold at about 10½ per lb. He had examined tea similar to that in

the packets in dispute and would assert that it contained not less than 40 per cent of Ceylon. As a matter of fact the whole of the tea was Ceylon sometimes; the proportion depended altogether upon the state of the market. The firm did not only study prices in buying tea: their object was always to give good value in the packets, and to accomplish this they always made careful comparisons of the real values of the tea they purchased for blending. Of course it was the natural tendency for the percentage of Ceylon tea to run down if the price rose.

Mr. GRAY:—Now, supposing that there is 40 per cent of Ceylon in the packets: do you think that the label, as it is arranged, is a correct description of the contents?

WITNESS:—Certainly.

Mr. GRAY:—Do you suggest that a person buying a packet like the one before the magistrate, after seeing the label, gets what he expects?

WITNESS:—I decline to suggest anything to the magistrate.

Mr. GRAY:—I am asking for your opinion. If you asked in a shop for coffee.

WITNESS (interrupting):—We don't deal in coffee.

Mr. GRAY:—I am not supposing that you do. But if you privately purchased what you believed to be coffee, and found that only 40 per cent was coffee, the remainder being chicory, would you be satisfied with your purchase?

WITNESS:—I have told you that I know nothing about coffee; I cannot say.

Asked what date the tea in question left defendant's warehouse, WITNESS could not say precisely, but it would be after May 1st, because the tea duty was reduced from that date and a small label was attached to the packet produced notifying that the price was reduced in consequence. As to the brand "Blackmoor Vale Estate," that was simply a fancy name. He refused to say whether the words printed on the label did not imply that the tea was actually grown on an estate called "Blackmoor Vale."

Pressed by Mr. GRAY to say what the words were intended to imply when they put on the packet, WITNESS asserted, with some warmth, that they were intended to imply nothing at all. He repeated that "Blackmoor Vale Estate" was purely a fancy name. Asked if he thought that the ordinary purchaser would consider it to be so, he answered in the affirmative.

Mr. GRAY:—Then you think that the old lady who goes into the shop for a packet of tea would suppose that the name of an estate printed on the package had no connection with its contents?

WITNESS:—My experience of old ladies has been that they think more about the interior than the exterior (Laughter.) The tea was sold on its merits, and those who bought it did so because it had a reputation.

Mr. GRAY said it seemed to him that as the proportions of the ingredients were constantly varying, the reputation could not always be the same.

WITNESS replied that the value of the blend never varied although the proportion of Ceylon did. It was putting the case rather unpleasantly to suggest that when the label was made defendants intended to use China tea if it would pay them to do so. They intended to use it if it improved sufficiently to justify them in making the change. Witness would admit that no China had ever been used, although the label with "China" upon it had been in use for three years. He did not know when "Ceylindo" tea had been first blended. The certificate of registration would show, but it had not been brought to the court. Pressed as to whether it was not the fact that the "Ceylindo" brand was adopted in consequence of a warning letter from the Ceylon Association, witness denied any knowledge of such a letter. He did not know even of the Association's existence at that time.

Mr. GRAY proposed to read a copy of Mr. Leake's letter to defendants, but Mr. Asquith objected.

Continuing, Witness said that the "Ceylindo" blend had been used for about 18 months. It was composed of Indian and Ceylon teas only. He was not prepared to admit that "Ceylindo" and "Blackmoor Vale" were practically the same tea. The latter was not, by a great deal, the most largely-sold blend; in fact "Ceylindo" had completely eclipsed all other brands sold by defendants. The "Ceylindo" label did not give any prominence to the word "Ceylon;" the brand having been introduced because the trade at that time were becoming rather doubtful of Ceylon tea. He admitted that the firm had a great many retail shops of their own. The shops of the "International Tea Company" belonged to them, and they also owned the shops carried on under the name of "Hull & King." The name was as well-known as St. Paul's Churchyard. (Laughter.)

Mr. GRAY:—You have half-a-dozen shops under that name, I believe?

WITNESS:—You are only about sixteen short. (Laughter.)

Mr. GRAY:—Now, to go to another point, you say on your "Blackmoor Vale Estate" label, "Imported by Kearley & Tonge." Is that correct?

WITNESS:—No; we do not actually import the tea. But it is a very usual thing in the trade, and in all trades, to use that expression.

Pressed by counsel as to what meaning the words were intended to convey when they were put on the label, witness said that they were intended to convey no meaning at all. He certainly could not justify their use under the circumstances. The label so printed three years ago was still in use.

Counsel here produced a large show-bill, bearing a brightly coloured picture representing a tea estate, surmounted by the words "Blackmoor Vale Estate." Witness did not think the show-bill implied that the picture was a representation of the estate where "Blackmoor Vale" tea was grown and packed; it was merely an attractive form of advertisement. His firm did not buy their teas at public sales; they bought them from other people who did buy at public sales on commission.

Mr. GRAY:—Then the importation is two removes away?

WITNESS:—I have already admitted that we did not import the tea.

Mr. GRAY:—You heard the evidence of the experts last Saturday?

WITNESS:—I heard the evidence of the so-called experts.

Mr. GRAY:—Never mind that; we call them experts.

Continuing, WITNESS said he had no independent experts to give evidence rebutting the testimony of Mr. Stehn and Mr. Anderson. But he had in court the actual mixer of the teas and the person who had given him instructions as to the proportions to be used. He did not agree with the witnesses who had said that it was possible, and easy, to distinguish between Indian and Ceylon teas. It was very difficult; often Ceylon tea was so "Assamy" that the most experienced men could not decide whether it was Ceylon or Indian. To say that the two growths were as distinct in flavour as port and sherry was absurd.

Mr. GRAY:—Then if Ceylon tea were wrongly catalogued as Indian the buyers would be unable to tell the difference?

WITNESS:—Sometimes not. (Laughter).

Mr. ASQUITH, re-examining witness, produced certain contract-notes giving particulars of teas bought by the defendants.

Mr. GRAY said that these particulars gave no information as to the proportions used in the packets in question; and Mr. Marsham shared this view.

WITNESS proceeded to state that between January and May in the present year his firm had bought about 100,000 pounds of Ceylon tea and 150,000 pounds of Indian.

Mr. GRAY again remarked that this was not material evidence; the magistrate concurring, and pointing out that evidence as to the quantities of tea purchased was no proof of what the tea was in the packets.

In answer to Mr. Asquith witness asserted that there was no ground whatever for the suggestion that "Ceylindo" was adopted under a threat of prosecution by the Ceylon Association.

Mr. THOMAS LILLICOE, examined by Mr. Asquith, said he was the buyer and blender of teas for defendants.

Cross-examined by Mr. GRAY he said that he kept a record of the proportions of each kind of tea used in blending. A small pocket-book was produced from which witness proceeded to read figures to show that the proportion of Ceylon tea used in the "Blackmoor Vale" packets had varied from 40 to 80 per cent. Sometimes 100 per cent had been used. There was never any China in the blend.

Addressing the magistrate, counsel for the prosecution said that the book produced was perfectly unintelligible.

In answer to further questions witness said that all the tea was mixed on the firm's premises by men in their employ. He was not present when the tea was mixed; but he gave instructions as to what was to be done. The change in the proportions from time to time was caused by the rise and fall of the market. He had not thought it necessary to do more than make an entry when any change was made.

Mr. GRAY remarked that only the months had been put in the book for the dates when alterations were made; the day of the month had not been entered.

WITNESS went on to say that the firm had never kept any record of the actual quantities of the different teas used from time to time; only the proportions being made a note of. Those entries were made at the time when the blends were altered.

FREDK. SHARPE was called and examined by Mr. Asquith. He said it was his duty to receive the teas to be blended, and to superintend the putting of them into the mixture. He had to weigh them up; about 2,000 lb. would be blended at one time. His instructions came from Mr. Lillicoe in writing; he had not brought any specimens of these to the court. After the instructions had been carried out, he had to return the written papers to Mr. Lillicoe, accompanied by a sample of the tea. Witness had been engaged in the same workshop for about two years; he knew the blend called "Blackmore Vale." During the whole time he had superintended the mixing of that tea, there had always been used, as one of the ingredients, a substantial proportion of Ceylon, varying from time to time. He did not superintend the putting of the tea into the packets; the system was that the packers should come to him and ask for the particular teas they were required to pack, and they were given to them. There had never been any China tea in "Blackmoor Vale Estate" blend; the only ingredients were Indian and Ceylon. In answer to Mr. Gray, witness said he always got written instructions from Lillicoe, and these instructions were always handed back to him when they were carried out. Mr. Gray, addressing the magistrate, said he would call for the production of those instructions. Witness said it was not the practice to keep the instructions when done with; they were destroyed. Mr. Gray submitted that there was no documentary evidence whatever as to the quantities of the different teas used in the blends for the packets before the court.

Mr. MARSHAM:—That may be, but it can't be helped. He says the papers were destroyed.

Mr. R. O. HEARSON, examined by Mr. Gray, said he was a label designer and had designed the label for the packets in question. (Plates produced.) Mr. Kearley wrote the signature on the label; the name of Mr. Heseltine was formerly also on the label, but it was afterwards removed. Instructions as to the wording of the label were given him by Mr. Kearley; the design was witness's own. When the words "blended with India and China" had to be added, witness was told to add them without altering the character of the label.

Mr. ASQUITH, addressing the magistrate, said he did not know what better proof could have been given that the tea was a pretty equal mixture of Ceylon and Indian, than that which the witnesses for the defence had brought. It had been shown that the tea was bought by Kearley & Tonge, and actually delivered in the chests into their warehouse. Then one witness had said that he himself took the tea out of those chests and superintended the mixing of the various kinds according to instructions given by Mr. Lillicoe. What else remained? The tea was put into bags with a label attached to each, and the bags were taken by the men whose duty it was to pack the tea for the grocers, and they made it up into little packets like those in court. These being the facts he did not see what more proof could be given. He did not know what other evidence could be required. No instance had been produced in the evidence in which less than 50 per cent of Ceylon tea had entered into the "Blackmoor Vale blend." Of course, an accident might happen in the packing; but he thought that there was no reason why all the packets should not be alike. As to the signature, he would remind them that the flourish was exactly the same on the labels before the words about the tea being a blend were added, and therefore at that time the flourish could not have been used for the purpose of fraud. It had struck him, when he first saw the label, that the sentence "blended with India and China" was printed in very small letters as compared with the words "Pure Ceylon Tea." But he had gone very minutely into the label. He would point out that if the words in small type had been printed so in the first instance the case would be different. The defendants, however, were dealing with an existing label, in which a great deal of artistic talent had been displayed, and they had to adapt the label to altered circumstances. They did what was natural, they took as much room as they could for the words relating to the blending. That accounted for the difference in the size of the type used. It had been said that the words "Blackmoor Vale Estate" added to the falsity of the description. Now, it was well-known that Blackmoor Vale was a place in England, and nobody ought to suppose that the tea in the packets came from an estate in Ceylon of that name. It had been admitted that no China tea had been used; but he thought it would be stretching the Act very considerably if it was held that the defendants were blameable for not depreciating the quality of the tea by putting in a growth of a lower quality and price.

Mr. GRAY rose to reply, but Mr. MARSHAM said that he need not do so unless he had anything of importance to explain.

In giving the judgment Mr. MARSHAM said that after the evidence he did not think he could hold that the flourish of the signature was extended with an intention to obscure the small words about the tea being blended. But it was certainly true that the words "blended with" were not visible to the ordinary purchaser, and of the other words—"India and China"—one was admitted to be falsely used. Considering, in addition to this, that the words "Pure Ceylon Tea" were printed very prominently across the label, he thought that the label was deceptive. The charge of false description was proved, and he would impose a fine of £10, allowing £5 5s costs.

The case created considerable interest in Court.

CASTOR OIL.—We are indebted to a planting correspondent for a correction in the quotations we give monthly in our *Tropical Agriculturist.* He writes:—

"In your June number I noticed that castor oil was quoted at 3d to 4d per oz.; it struck me then as incorrect, but I now see the same statement made in the new publication about aloe and ramie fibres. This rate surely means per lb., as castor oil can be bought at 1·50 per gallon, which would equal ·01 cent per oz!"

We have had "lb." substituted for "ounces" at once in our list. In a recent Nuwara Eliya Report, Mr. LeMesurier speaks of the castor oil plant as growing at Walapane like a weed and he is anxious to encourage the natives in regular cultivation more especially as one Colombo firm is prepared to take 400 gallons of the oil per month—no doubt for lubricating purposes?

THE MADRAS GOVERNMENT BOTANIST ON CINCHONA CULTURE.

To neither the Madras Government nor Mr. Lawson its botanist and quinologist, are we, as yet, indebted for a courtesy which might very well have been expected, in the shape of a copy of Mr. Lawson's Report on Cinchona Culture in the Wynaad. Baron Rosenberg, however, indicated its chief points, in the letter we published, and now we find the report substantially quoted in the *Madras Times*. We see no reason to alter our opinion that the Madras quinologist attaches too much importance to "food starvation" as he calls the supposed effect of the absence of humus or its deficiency, and too little to the mechanical condition of the soil. We long ago discovered in Ceylon that in stiff clayey soil, largely impregnated with iron,—soil in which tea flourishes,—cinchonas cannot be grown. Also that soil rich in humus, but water-logged, was equally fatal to the fever plants. But we have had no confirmation of the principle which Mr. Lawson so positively propounds, that "what kills coffee kills cinchona." Although cinchona is of the same natural order with coffee, it has never been attacked by, far less has it died from, the effects of *Hemileia vastatrix*. The trees have grown together side by side in the same field; and while the coffee has been debilitated to death by repeated attacks of the fungus, the cinchonas have never suffered from this cause.

Now that the price received for ordinary bark scarcely pays gathering and sending to market, it seems like mockery to be told that the more manure used the better, and to be advised to resort to costly cross-trenches mulched with hill grass. The latter is said to be collected at small expense. But in the days when mana grass was used largely for cinchona nurseries in Ceylon, and the grass had to be conveyed any distance, we know that the cost was not small but very serious. Recommendations to manure and till liberally; to plant widely; not to take bark until the trees are six years old, and subsequently to harvest only at intervals of three years, are no doubt excellent in theory. But practically the question is will such cultivation pay, now, or at any period in this nineteenth century.

THE CEYLON AMERICAN TEA COMPANY.

We are by no means favourably-disposed to the proposal made by Messrs. Wattson & Farr for the re-organisation of this Company. If the enormous proportion of shares required for themselves really mean a return for very large expenditure, they ought for the sake of their good name at this end, among people not accustomed to American ways of doing business, to be much fuller and more explicit in their explanation of how they proposed to spend the money in order to secure the floating of the New Company and its profitable support over all the States of the Union. But at the same time we most fully recognise the difficulty in which the local Directors of the existing Company were placed. What is there, for instance—according to the law of the United States—to hinder Messrs. Wattson & Farr starting their own "Ceylon-American Tea Company" any day they please, free of the encumbrance of paying back (as they offer to do) the capital in the existing Company? There is no power at this end to prevent their trading with the name of "Ceylon" or "Ceylon planters" in the States, and it would seem wise therefore not to cast them off, but to make the best of the responsibility attaching to a Company working in co-operation with a local Directorate. A planting shareholder who takes this view and who criticises a contemporary's utterances, writes as follows:—

July 18th.—I do think the local "Times" leader on the Ceylon American Tea Co. Ltd., as given on the 12th, in good taste, and is it not very misleading? Of the 6 000 shares of the original Co. only 1,747 are subscribed for, leaving 4,253. To buy those and assist in the formation of the New Company, looks to me very like buying R2 for R1. For every share held at present by stockowners, the New Company will allot 2 shares of $20 each or $40 = to say R108. So the present holder of a R50 share will get in the New Company's stock worth R108, for each share, or he has the option if he prefers it (read last paragraph in Wattson & Farr's letter) of retiring from the concern and receiving from them the R50 he has paid. They say—"We personally agreeing that if the new Company is undertaken, we will take up any shares of parties who may now be stockholders should they not wish to accept the proposal." Surely this is good enough; at any rate I shall stick to my stock, and think it worth while just putting a trifle more in. Your contemporary further says something about exigencies of trade compelling the new Company whose name is registered, to sell other than Ceylon teas. But the writer forgets it is a Company to be formed "*strictly* for the representation of Ceylon Industries." (See Wattson & Farr's letter last para but 2.) And to watch this, there will be the Board on this side.

The 28,000 shares to be handed over for *getting up the Company and for advertising, travelling* &c., &c. (see Wattson & Farr's letter) only mean £112,233. And what is this for an American Boom! especially if as the local "Times" editor says, it is "*to register the Company in every State in the merican Union*"? At any rate it may be said that "the £112,233" are not to come from Ceylon, but from the countrymen of Messrs. Wattson & Farr who are generally credited with remarkable acuteness about their investments. We suppose the prospectus of the new Company will be laid for approval before the Ceylon Directors, and clearly there must be a better guarantee for this new Association dealing in pure Ceylon produce under the joint arrangement, than if Messrs Wattson & Farr established a tea business of their own without reference to the existing Company.

DAVIDSON'S SIROCCO.—Can any of your readers tell me how a steady heat is kept up on a Davidson's large size Down-Draft Sirocco Tea Dryer. I find that the temperature drops from 385 deg. to 210 deg. before it hits the tea on the lowest tray. I also find that it takes 5 maunds dry wood too each maund of tea, that it does not turn out anything like 2 maunds per hour. Each one of these points contradicts Davidson's advertisement. Can anyone with practical experience tell me how to remedy them? A Darjeelingite. *P. S.*—I do not find that it puts price on tea, it only enables you to dry with other material than charcoal.—*Indian Planters' Gazette*, July 1st.

RAKWANA, July 12th.—Gemming operations are not progressing in such a satisfactory manner as was expected, and Mr. Baddeley does not seem to be at all satisfied with his Sinhalese laborers. To tell the truth, tempted by the liberal wages offered by Europeans, several persons of questionable character with no knowledge whatever of gemming took up work under the Gemming Syndicate. Mr. Harding of the Gemming Syndicate is expected here tomorrow. The plumbago mine on Barra is paying very well. Recently a sapphire weighing 19 carats was found by one Adonis Perera either on Spring Vale or Know Hill Estate in Kukulu Korle. The finder, not knowing the value of the gem, sold it to a Sinhalese boutique-keeper for R350. The later, who has a good knowledge of gems, had an offer of R1,900 for it; but he declined to part with it, and expects a much larger sum.—*Cor.*, local "Times,"

Correspondence.

To the Editor.

BARON VON ROSENBERG ON MR. LAWSON'S THEORY OF CANKER IN CINCHONAS IN INDIA:

Practical Experiences and Advice.

Tulliar, Devicolum, June 6th.

Sir,—Some time ago Mr. Lawson was asked to report on the canker and general decay of cinchona trees in the Wynaad. A good many of your readers must be interested in this question, I trust therefore you will find space in your columns to insert these few lines.

I have now seen Mr. Lawson's report, and from a planter's point of view it is not in any way satisfactory.

It is short, it is not very much to the point, it certainly seems misinformed in its premises, and illogical in its deductions. To us this would matter little, we could content ourselves with saying "Mr. Lawson is wrong;" certainly "we have learnt little from Mr. Lawson."

But there are planters who may be opening out cinchona estates, or taking them over from others; or agents, who, knowing little about planting, may insist upon taking Mr. Lawson's report as gospel, having the policy he advocates carried out. For the sake of these a note of warning should be sounded. Mr. Lawson's first conclusion is that cinchona estates are not sufficiently worked. Granted! But who is to blame for this: not the producer in this, that, or the other district, but the large cinchona-producing community all the world over. The prices obtainable for produce are so low, that estates cannot be thoroughly worked.

And it is here, at the very outset, that Mr. Lawson tumbles into his first error. He says that in former times, when the product paid better, it was right that cinchona trees should be planted close; well it is just because prices are so low, that now only close planting pays. If we planted wide apart, how many lb. per acre should we get off clearings under 15 to 20 years old? how could we make those few lb. per acre pay at a minimum profit?

Again Mr. Lawson insists upon the necessity of preserving the soil. Very well indeed! But how can the soil be better preserved than by covering it as soon as possible, *i. e.* by close planting and thinning out afterwards if necessary? But where Mr. Lawson is surely entirely mistaken, is when he ascribes the canker in the Wynaad to poverty of soil only. If Ooty were unknown to Mr. Lawson, if he had not seen the Government and other plantations there, thriving in soil so poor, under circumstances so wretched, one might forgive him. But as it is the arrogance of the statement is delicious. He virtually seems to say: "You in your Wynaad lands which are rich enough to have supported magnificent forests, and undeniably fine coffee, are not on a par with us the children of the higher mist whose lands never supported anything but scrubby grass and stunted rhododendrons; for lo and behold, with us cinchona thrives, with you it dies, therefore (i. a. a.) we have soil, you have none!

Mr. Lawson deigns not to go into the varieties of canker or diseases so named or misnamed. He contents himself with insinuating that those foolish old men, who imagined a specific disease, were utterly mistaken. There is none. Manure your plants sufficiently, and they 'll grow equally well on the top rock of Dodabetta, yea down unto the quay of Calicut.

Mr. Lawson goes on to inform us, the ill-informed, that coffee and cinchona belong to the same species. He deduces therefrom that they thrive under like conditions only. Let him plant a coffee bush on the windblown steeps of Dodabetta, or a cinchona tree in the club compound of Madras, and they 'll thrive as much as a Lapp would in the Sahara or Ramaswamy on Mount Hecla. And yet Lapp and Ramaswamy belong to the same or forked radish species. And though it be true that both coffee and cinchona belong to the cinchonaceae they differ in most particulars, such as flower, seed, quality of bark. And chiefly they differ in the purposes for which we grow them, for we do want coffee to flower and seed, we object to it in cinchona.

To sum up, I am positive that they cannot and do not necessarily thrive in the same soils and localities.

And to these generalities I will add from my own observation. I am now living on an estate at from 4-5,000 ft. elevation, on which both cinchona and coffee have been largely planted. Well, a few years ago, there was among them a magnificent field of cinchona *var. condaminea*. Some 4 years ago canker showed in a few patches, and these were planted up with coffee. The canker is now spreading, has indeed assumed alarming proportions, and it has been decided to plant up the whole field with coffee. And why? Because in the soil which according to Mr. Lawson must be too poor to support its equal feeder cinchona, it thrives remarkably.

Again, to take the reverse of the picture. Cinchona (a strong grown hybrid) was planted among young coffee, it shared all the manuring of the coffee, it was planted fairly far apart, it had every advantage that Mr. Lawson claims for it, yet it died; the coffee died not, but is flourishing.

Again, there is a small bit of cinchona here (mostly Condaminea), planted in a landslip, *i. e.* land entirely denuded of its topsoil, and which has been considerably neglected, yet the plant seems thriving.

Let us take another estate next to the foregoing. This was felled and planted up with cinchona, Ledger and Hybrids. The soil is remarkably rich, and good pits were made, yet now in its fifth year there is hardly a stick left standing. I thas since been, and is being planted up with coffee, and the coffee is remarkably vigorous.

And now let me turn to another side of the district, a few mile s away, a few hundred feet higher. There cinchona, though closely planted, is perfection, such as probably Mr. Lawson has never seen. It has gone out in a patch here and there, but the rest after 10 years and several croppings looks perfectly healthy, and this in spite of the fact, that in one two places that I know of, it was not even pitted for, but only dibbled in. And there cinchona even now pays, but it would not pay, if it required cultivation, beyond weeding, and perhaps an occasional surface digging.

Mr. Lawson's report in fact comes to this, he says: the patient is sick because he is starving as for any sickness, he cannot discover it, and therefore cannot diagnose it. There is no harm in the latter: we may be as unable to give the diagnosis as Mr. Lawson is, but we will eat our hats, and planters' hats are proverbial, if actual disease does not exist or if it is due to want of food material chiefly or only.

Cinchona does thrive in poor soils, as far as absence of canker is concerned—poor at all events in *humus*, viz. on the Pulney Hills or even on

Mr. Lawson's own Dodabetta. That there may be *mineral* ingredients sufficient in these soils is not denied, but analysis of the Wynaad soils shows no lack of these mineral ingredients either.

One of our overseers, who has been at planting for many years, takes the very opposite view to Mr. Lawson and says "canker is due to richness and not proverty of soil." I am not inclined to go all the way with him in this statement, but I think he is nearer the truth than Mr. Lawson. Why else is there so little canker in cinchona planted in sterile grassland, such as that of Liddlesdale, Belleview and other estates at Neduwattam, and Ooty? Very much to the point is a clearing near here, at Devicolum, where a patch of grassland cinchona adjoins, and is under the same conditions in every way, as a plantation in felled forest land. The latter has suffered from canker here and there, the former not at all. And here I would call Mr. Lawson's attention to a fact he is either ignorant of, or has ignored. I mean the fact, that there are certain jungle trees, the dead roots of which will kill out tea, coffee, and especially cinchona. Perhaps this is the explanation of patches among otherwise healthy cinchona, planted in forest land, and their non-appearance in grassland.

I would also add that for the actual growth of the cinchonas, and for the analyses of their barks, a rich soil, either naturally so, or produced artificially, is no doubt preferable, but these questions are wholly apart from that of canker.

After all this denial of Mr. Lawson's theory on canker, you will expect me to pronounce a theory of my own, yet I must own, that I hardly have one, and every planter worthy of the name will approve me, when I say that all theories on the subject are and can at present be mere guesswork, or at the best an honest attempt at deducing from visible facts. Such, however, as my opinions, on the subject are I will give them, and your readers must take them for what they may be worth. It is then my belief that there are three diseases that attack cinchona and can prove deadly to it, call them canker, or anything else you like:—

1stly, a disease which begins at the top of the tree, sometimes at the end of the branches in the shape of a withering and drying up of the leaves and younger wood. I would ascribe this to not enough sun; in some clearings to a windy aspect. This rarely, hardly ever proves fatal.

Secondly, there is the disease which attacks the roots of the tree, sometimes working from the feeders upwards, sometimes from the collar downwards. This is always fatal in the former case. In the latter, if the evil be perceived before the whole of the collar is affected, a cutting away of the affected part which outside has a red or black, inside a rotten white appearance, may save the tree, at all events for a time. This disease I attribute to a clayey subsoil, a lack of drainage in the sub or surface soil or, to the effect that wind has had on the plants when young, bending them to and fro, and thus hardening "ultra fas" the tissue at the point of resistance, *i. e.* the collar.

Thirdly, there is the disease, which attacks any part of the stem from the collar to the second or even third set of primaries. This is a sort of desiccation of the bark in parts, followed by a congestion in others. We planters, in perhaps unscientific, but very expressive language, say this is due to the plant being hidebound. Taken at an early stage, and other circumstances being favourable, it can sometimes be remedied by running a knife up the stem, thus liberating the flow of sap. But circumstances as a rule are not favourable, when this species of disease sets in, and I would, from my experience, attribute by far the greater proportion of the mortality among cinchona in India, at all events, to the latter form of canker. That it is due to a stoppage of the flow of sap, is proved by the fact, that exudation sometimes sets in below, or beside the part affected, and that principally at the times of year, when sap rises abundantly.

I would attribute this disease to drought principally, such drought as is general in India during January, February and March. It stands to reason that it is far worse at low elevations where the heat is greater, and high and intensely dry winds usually prevail during these months.

At such lower elevations the desiccation of the bark is more or less universal (though less felt in sheltered parts) the cambium is so "hidebound" by the shrunk bark, that it cannot pass the rising sap: hence the latter exudes or is dried up in the bark. "Pas de sang pas de vie," and the tree dies. At higher elevations this form of canker is rare; when it does appear, as a rule it only desiccates the outer bark, and is therefore often remedied by above process of running a knife up the stem.

Even at lower elevations, I have kept a clearing of cinchona alive for a year or two, when suffering from this disease, by ripping up the bark on both sides of every tree. Not that I expected those trees to live indefinitely, that I knew was hopeless, but because I hoped to and did get a crop of renewed bark. Such then is my theory, faulty no doubt, but the result of past and present observation and experience of my own, and my brother planters in this district, which must, in its lower elevations, resemble other districts, among them the Wynaad.

As for the cinchona planters of the latter district, I have no message of hope for them. I would not, as I may have seemed to argue, advise their planting up their grasslands with cinchona, but on the other hand, I cannot advise their planting up their forest land or trying to keep up their present clearings, at all events those parts affected by canker.

Mr. Lawson argues from the fact, that there are still enormous cinchona trees in the Wynaad, and tries to deduce therefrom that thousands of other giants may yet be reared. But Mr. Lawson's premises must be statistically strengthened before we can accept them. Those giant cinchonas are probably the result of the survival of the fittest, both as to plant and locality. They were probably planted with others, and the others died. And so in the future, only with larger numbers the *others* will die, and some few remain. Beyond all this, however, there is a circumstance, which Mr. Lawson has not even touched upon. I mean the possible, nay the certain deterioration in the seed, from which present plantations have been reared, as opposed to that, from which the older plantations have grown up.

Those old giants of the Wynaad and elsewhere are no doubt the result of seed, either imported direct, or taken from trees not barked. This, unfortunately, has not been the case with seed used for most of the later plantations, which has, as a rule, been taken from trees previously weakened by cropping, and that too of the old stripping kind.

In proof of this I will only mention, that a few years since when there was such a scramble for Ledgeriana, seed was sold, stated to be off trees giving from 7 to 14 per cent sulphate of quinine, *i. e.* not only must the parent trees have been barked, but the analysis must even have been obtained at least after the second barking from renewed bark. Let this vitiated seed be put among circumstances somewhat adverse and disease will immediately fasten on the plant nor will the latter have strength to rally. Put it among healthy circumstances, and, like a puny child well cared for, it *may* pull through.

In conclusion, my advice to cinchona planters in this Presidency and probably Ceylon also, is: Do not plant cinchona of any kind below 5,000 feet. If needs you must plant cinchona, go up, up, up, and plant some good hybrid.

Do not try and preserve your cinchona, if you see it going out from stem or root canker, at a lower elevation, it would merely be throwing good money after bad. And even if you tried to, and succeeded in preserving it for some few years, by the expensive means advocated, look at your accounts, and see whether present and near future prices will reimburse you for such cultivation.

For all this I am simply giving my opinion for what it may be worth, and for the sake of the Wynaad planters I sincerely hope I may be wrong. Even for my own sake and the cinchona I still have at lower elevations, I shall be glad if my opinion is refuted.

Finally, hard as I may seem to have been on Mr. Lawson in my statements, it is not for my own benefit that I express them. It is for the sake of my afflicted brother (cinchona) planters, that I have written. I therefore trust Mr. Lawson will not take my remarks amiss, and if he cares to come up here and, if possible, change his opinion he will find us not bad hosts, and growers of A1 cinchona.

I am also very willing to admit that Mr. Lawson's advice, in other directions than those touched upon, is excellent. But a better market must rule before we can carry it out.—I am, sir, yours faithfully,

J. v. ROSENBERG.

TEA IN CEYLON.

DEAR SIR,—You are not quite accurate in your leading article of the 20th inst. under the heading "The Earliest References to Tea in this Island" and you do Bennett an injustice when you say, his botanical blundering was speedily exposed." Bennett says (p.p. 276-7.) "The late Asst. Staff Surgeon Crawford in 1826 sent him from Batticaloa a very fine specimen of what *Crawford* considered the real tea, it fully answered the generic description of *Thea Bohea* of Linnæus, and he gives a colored plate of the sketch he took of it, and *then adds* "but I was altogether unsuccessful in my own researches for the plant in the jungles of Mahagampattoo." Percival (1805) pp. 330-1 says the tea plant was found native in the forests and growing spontaneously in the neighbourhood of Trincomalee: He further says the soldiers of the garrison sundried the leaves and boiled them and many preferred the decoction to coffee! &c., &c. On the other hand Cordiner (1807) says (p. 285.) "The real tea tree is not indigenous in Ceylon, but the island produces several species of that genus," &c., &c.

E. B. CREASY.

[We are obliged to our correspondent for his interesting notes, but we scarcely think we have done Bennett an injustice, for in publishing the plate he took the responsibility attaching to the belief that the true tea plant had been found growing wild in Ceylon. This will we think be seen from a perusal of the full passage in Bennett. He ought to have taken steps to verify Dr. Crawford's supposed "find," before he lent his authority to the statement that the tea plant existed in Ceylon.

(*From "Bennett's Ceylon and its Capabilities."*)

The jungles adjoining this place, and throughout the Mahagampattoo district, abound with the "wild tea tree," as it is called, but which, I am informed, is a species of *Orchis*. It bears yellow flowers; and the poorest people are accustomed to use the leaf both for food and drink; for the former, boiled and mixed with *Tyre*, and for the latter, an infusion of the green leaf. It is called *Gal-Kuroo* by the Sinhalese; who also employ the leaf of another plant, which greatly resembles that of the *Thea Bohea*, L., and is called by them *Rata-The-Kola*, (or Red-Tea leaf,) in a similar manner.

Although the infusion of the green leaf is a very bitter drink, it is an excellent tonic, and its taste may be greatly improved by the addition of the indigenous lemon grass (*Andropogon Schœnanthus*, L.) and sugar; but that made with the dried leaf, is a tolerable subs itute for Bohea tea.

The late Assistant Staff Surgeon Crawford, at the time he superintended the hospital duties at Batticaloa, in 1826, sent me, by a native *Dhoney* bound to Hambantota, a collection of insects and plants; and among the latter, a very fine specimen of what he considered the real tea, in flower. It fully answered the generic description of the *Thea Bohea* of Linnæus; and, as it both flowered and seeded freely, I made a sketch of it, of which an engraving is annexed. but I was altogether unsuccessful in my own researches for the plant in the jungles of the Mahagampattoo.

Mr. Crawford did not assume any merit to himself as having made a new discovery, and it is very clear that the Dutch were well aware of the tea plant being indigenous in the eastern province; but it is to be wondered at, that the Government has not, long ere this, directed its attention to so important an object of commerce; for if it be worth while to cultivate tea in so distant a country as Assam, with all its inconveniencies and dangers, surely it would be a more lucrative speculation, in a colony so much nearer home, and with increased facilities of export. But this, like the bread fruit tree, is another *chance* discovery; and a better acquaintance with Ceylon in 1787-1789, would have rendered the two expensive trips to Otaheite, for supplying the West Indies with bread fruit plants, inexpedient; for they could have been obtained in any quantity from this island, and have obviated all the disastrous consequences of the mutiny on board His Majesty's ship "Bounty."

Captain Percival, in his "Account of Ceylon," published in 1805, informs us, "that the tea plant has also been discovered native in the forests of the island. It grows spontaneously in the neighbourhood of Trincomalé, and other northern parts of Ceylon. General Champagné informed me that the soldiers of the garrison frequently use it. They cut the branches and twigs, and hang them in the sun to dry; they then take off the leaves, and boil them to extract the juice, which has all the properties of that of the China leaf. I have in my pocket a letter from an officer in the 80th regiment, in which he states that he had found the real tea plant, in the woods of Ceylon, of a quality equal to any that ever grew in China, and that it was in his power to point out to Government the means of cultivating it in a proper manner."

—ED. *T. A.*]

JUTE MESH FOR WITHERING TEA.

Ivies, Yatiyantota, June 25th.

SIR,—Referring to your note attached to my letter *re* Jute Mesh for withering I wish to say that the coarse sample sent you is that of the cloth that the Calcutta firm say the Indian tea estates have been using for some time for withering. It weighs 16 ounces per yard and would cost 17 to 18 cents. I do not think it suitable for *withering* tats, though it might be useful for drying wet leaf or for covering reeper floors; but I hope that *Jute Twist Mesh* weighing 10 to 12 ounces will be found to be as strong and cheap and consequently superior for this, the purpose for which I intended *it*.

The fine sample sent you is one of those I had made in England, but I consider it rather too light for withering tats. If it were made as described in my previous letter under the name of *Jute Hessian Mesh* I think it would be about equal in weight and strength to the hessian now used; and I see no reason why it should be dearer out of proportion to its weight.

I am awaiting further information from Calcutta, which I shall be glad to send you when received.—Yours truly, E. F. DAVIS.

[We shall be glad to hear further.—ED. *T. A.*]

THE BEGINNINGS OF TEA IN CEYLON.

Central Province, June 26th.

DEAR SIR,—In a late leading article reviewing the names of earlier shippers of tea you have entirely omited the names of Messrs. Saunders, Mercers and Scovells. Yet Blackwater and Adam's Peak should not be forgotten. Blackwater tea is older than most Ambagamuwa tea. Blackwater, Strathellie and Galboda are about contemporaneous, with a call in favor of Blackwater, I think.

Adam's Peak averaged a fraction over 1s 5d all round—and all tea shipped but red leaf—in 1883.

A portion of Mariawatte was planted from Blackwater seed. None of the gentlemen, proprietors, or superintendents, connected with the estates I have mentioned are, as far as I know, expecting testimonials from the public. Nor does Mr. Armstrong. Do not Mr. Jas. Taylor's proprietors reward him as he deserves? If not, why not?—Yours truly, M. D.

[We are obliged to "M. D." for his corrections—which have just come in time for the last sheets of *the* book—but not for his snarl about the Loole Condura testimonial. Does he mean to place any of the names he mentions on the same footing as the pioneer of the "Sixties" and "Seventies" in cinchona as well as tea?—ED. *T. A.*]

TEA PARCHMENT *V.* TEA LEAD.

SIR,—Can tea planters any longer afford to give away expensive boxes and lead linings? We sell tea, not wood and lead, and it is quite time a fixed charge was made for packages, at least as much as the dealers can sell them for. What power is there in the trade to enforce this customer? If no other power, let the growers themselves make the necessary stand. Again, why continue to se expensive lead for lining our chests, when farch eaper and equally efficient substitutes are avilable?

In the face of the profits and commsisions that are made on lead by importers and agents, the planter has much to contend against in his efforts to make this change, or changes of any kind, but surely as a body, moving as one man, much could be effected. I have seen a returned lining of parchment in which the tea went home and kept perfectly sound and sweet. Where then is the obstruction to its general adoption seeing that the cost is about one-half?—Yours faithfully,

TEA PLANTER.

TEA PACKED WITH PREPARED PAPER IN PLACE OF TEA LEAD.

London, June 27th.

DEAR SIR,—I have pleasure to inform you that the break of Elkadua tea sent home in the prepared tea paper has met with every success.

The break, as I think I mentioned to you when in Ceylon, was divided in two,—½ being packed in paper, the other in the ordinary lead. The result of sale was precisely similar, each break fetching exactly the same figure viz. 10¾d (pekoe).

The trade has made no objection whatever to the paper, and as it will cost about 40 per cent less than the lead, there does not appear to be much doubt as to its ultimate success.

I have recently had an application for samples from the Kangra Valley Planters' Association along with other Indian concerns.

I have today written the Chairman of your Planters' Association and sent him further samples at his request.

I propose substituting this paper entirely for tea lead on the Elkadua estate, where we have close 1,000 acres of tea, and where the saving will of course be very considerable.—Yours truly,

J. MAITLAND-KIRWAN.

A QUESTION FOR ROSE CULTIVATORS.

Kandy, July 1st.

DEAR SIR,—I shall be glad if you can tell me if it were ever known before that the rose could be propagated from the leaf. I have tried this mode of cultivation and have found it eminently successful—indeed leaves seem to strike more surely than slips.—Yours faithfully, J. DUNBAR JONKLAAS.

IGUANA SKIN FOR SHOE LEATHER IN CEYLON: WHAT ABOUT OUR CROCODILES?

Jaffna, July 2nd.

DEAR SIR,—Perhaps you are not aware that the skin of the iguana is made into shoes, though not extensively, in Jaffna. I saw a pair of child's shoes made of its leather, and was struck with its novelty and the ingenuity of the local shoemakers, who, in Jaffna, are invariably Moormen. It is evident from this that one use of it at least is known to the natives of this province, and that they cannot be quite strangers to the mode of dressing the skin, if such nice soft shoes as those I saw could be made out of the local preparation. I trust your remarks will commend this industry to the authorities, and this poverty-stricken, though industrious, people will have another means of earning a subsistence when such means are not many and where nature has been niggardly in bestowing her benefits.—Yours truly, A STRANGER.

MINERALS IN CEYLON; BERUWALA.

Anuradhapura, July 12th.

DEAR SIR,—Your editorial note in the *Observer* of the 8th instant headed "Mineralogical" calls to my mind certain passages on the same head occurring in the works of two Ceylon authors which do not ever appear to have been sufficiently regarded, if at all.* I enclose them herewith, as they may be of some interest, even if of no value. I also enclose a short notice of a historical event which happened at Barbareen, Barbaryn or Beruwala, which place is briefly referred to in your issue of the 10th instant.—Yours truly, in haste. C.

Bennett's Ceylon, published 1843.—Extract (chap. xli, p. 331):—"The late Mr. Reckerman, Fiscal of Colombo, informed me that coal had been discovered in the island by the Dutch; but from there being such an abundance of wood, and charcoal the only fuel used by the native cooks, no notice whatever was taken of the discovery that mineral is now become an object of such great and general importance, as to be worthy of the most particular research, for the purpose of supplying fuel to steam-vessels, touching at Ceylon, on their voyages to and from Madras, Bengal, and the Red Sea, and would be one of the greatest acquisitions to the colony that discovery has ever produced."

[For the argument that neither ordinary coal nor anthracite exist in Ceylon, see monograph on plumbago in transactions of local Asiatic Society.—ED. *T. A.*]

* They have often been carefully examined and disposed of. See our notes to passages quoted.—ED. *T. A.*

Percival's Ceylon, published 1803 and 1805, Extract, chap. xvi, p. 357 (1803 edition):—"There were several mines of quick silver wrought by the Dutch in Ceylon. In 1797 Colonel Robertson found out one at Cotta about six miles from Columbo. The quantity we procured from it did not exceed six pounds but it afforded a most useful and seasonable supply to the garrison, as at that particular time all we had was exhausted, and mercury was the principal remedy resorted to in all liver complaints.

"Although some quicksilver was still procured from this mine, yet the labour and expense attending it was so great, owing to the want of experienced and skilful workmen that it was judged proper to give up working it altogether before I left the island: I have since been informed that the undertaking has been resumed at the same place with more success."

[See the paper already referred to.—ED. *T. A.*]

Percival's Ceylon.—Extract, chap. vi, pp. 129, 130:—Six miles onward from Calturalies Barhareen, a small village, with a sort of harbour formed by a projection of land where the river runs into the sea. This is almost the only place when the high surf and rocky shore on this coast permits shipboats of the European construction to land.

This place was signalized by a shocking catastrophe which took place here in 1795. A boat from his Majesty's ship "Orpheus" having been sent in here to procure fresh provisions, the sailors, confiding in the peace which then subsisted between the British and Dutch Governments, came ashore without any apprehension, and began to look out for water, a few fowls and vegetables. They were at first received with much apparent civility, and many promises that they should be plentifully supplied with the articles they required. This, however was only intended to amuse them, while a party of Malays stole unperceived between them and the boat, and fell upon them unexpectedly. Few of our men escaped this shocking treachery which was a-piece with the jealous and barbarous policy usually practised by the Dutch towards strangers who approach their colonies. The Malays who were the instruments of their cruelty on this occasion, were afterwards in dread of its being revenged upon them when our troops came before Columbo. Indeed it was a fortunate thing for them that the town was taken by capitulation as our men were very much exasperated against them both on this account, and their repeated attempts to surprise our camp before Trincomalie and Columbo.

[A different and, we suspect, a more truthful account of the Malays than that given by the same writer in his account of the massacre of the British troops at Kandy.—ED. *T. A.*]

At Barhareen there is a principal manufactory for making cordage and cables from the coconut tree. Large quantities are sent from hence to Columbo and Point de Galle, to supply the vessels which trade to these Ports.

GREEN TEAS: PATENT PREPARATION OF, IN CEYLON.

DEAR SIR,—Some particulars of our invention which renders the manufacture of true green teas simple and inexpensive may be of use to your readers. We have, as you are aware, patented the method as well as the machine in Ceylon, and hope shortly to do so in India. Our patent covers, 1. A method of rendering tea leaf pliable for purposes of rolling or twisting without resort to the process known as withering.

2. A machine for carrying out this method on a scale large enough to suit the largest factories. Green teas may be divided into two class s Oolongs or semi-green teas which are partially fermented, and true green teas which are wholly unfermented. These teas are the most popular class of tea in use in North America as shown by the fact reported to the inventors by Mr. F. Street, the local tea expert, that out of a total export of 51,000 000 lb. of China tea to the United States last season up to the middle of November only a very little over 1,000,000 lb. of tea corresponding to the ordinary Ceylon black leaf was imported, while of Oolongs there were imported 14,000,000 lb., and of the unfermented class which are the true green teas no less than 32,000,000 lb.

In view of the desire in Ceylon to introduce teas of this island into the American maket, it is thus shown to be highly desirable that teas should be manufactured of the unfermented class, and that a method and apparatus for insuring the manufacture thereof should be perfected.

OOLONGS consist of tea leaves withered either artificially or naturally by hot air or on hot plates, sufficiently to enable them to be rolled, when they are straightway fired.

The result of this process is that the effect called by some fermentation and by others oxidization is partially produced, and this effect prevents the leaves from being uniform in colour and causes them to vary from an olive green to a light brown.

TRUE GREEN TEAS are made only of leaf which has never been fermented or oxidized and when infused should show a uniform yellowish green colour which could never be obtained had either oxidization or fermentation taken place. The production of these teas has hitherto been found impracticable in Ceylon because leaf could not be rendered sufficiently soft or pliable to be rolled or twisted unless by its being withered either naturally or artificially by hot air or hot plates, which withering is in itself a degree of fermentation or oxidization.

It was therefore requisite to find a method of obtaining pliability necessary for the rolling or twisting process by other means which would prevent all fermentation or oxdization. The inventors claim to have discovered after long experiment, and to have been the first in Ceylon to practise their discovery, that leaf could be without resort to any process heretofore used in Ceylon causing fermentation or oxidization, be rendered sufficiently pliable for rolling by a method here-to fore entirely novel in Ceylon, which process not only produces pliability but absolutely checks all fermentation or oxidization. Full particulars of the machine can be obtained from Messrs. Brown, Rae, & Co., our agents at Hatton, and with each machine, instructions necessary for its use will be issued.

(Singed) H. D. DEANE,
J. T. RAE.

RAMIE MACHINERY EXHIBITION.—Another exhibition of ramie preparing machinery is to be held in the Agricultural Section of the Paris Universal Exhibition in August next.—*Industries*, June 14th.

TILE DRAINAGE.—Prof. J. F. W. Johnston, of Edinburgh, has said in his lectures on agricultural chemistry that "with the disappearance of the permanent state of moisture, the *coldness* of many soils also rapidly disappears. The backwardness of the crops in spring and the lateness of the harvests in autumn are le s frequently complained of, for the drainage in many localities produces effects which are *equivalent to a change of climate.*" He says further that "in consequence of the drainage which had taken place in the parish of Peterhead, Aberdeenshire, during the previous twenty years the crops were arriving at maturity ten to fourteen days sooner than they formerly did, and that the same was true in many other localties."—*Louisiana Planter and Sugar Manufacturer*, June 28th.

SEED PEARLS IN BORNEO.—From an official report we quote as follows:—"The Seed-pearl fisheries at Tetabuan and Lingkabo are in a more than flourishing condition, the Bajows tell me there is no fear of the present crop being worked out under two years. good worker can make a dollar a day.

"KEW BULLETIN."—The June number, now before us, contains an article on compressed or tablet tea, dealing with the methods of its manufacture at Hankow, and at Chungking in Thibet. Thibet trees of the Straits Settlements form the subject of another paper. It contains much useful information on a great number of different species, giving the weight of a certain number of cubic inches, and of a cubic foot of each and native names of the trees. Cotton in West Africa forms the subject of another paper.—*Gardeners' Chronicle*, June 14th.

VARIETIES OF TEA.—In a lecture on Tea before the Society of Arts, Mr. Richard Bannister has the following:—

The youngest leaves made the best teas, and starting from the end of the shoot, and numbering the leaves as they came from *a* to *f*, the following varieties would be obtained:—*a*, flowery pekoe; *b*, orange pekoe; *c*, pekoe ("poco" means "white hair" or down of tender leaves); *d*, first souchong; *e*, second souchong ("souchong" means "small plant"); *f*, Congou (means "labour," expressing the care required in preparation); *a b c*, Mixed Pekoe; *a b c d e*, mixed pekoe, souchong. Hyson means "before rain," or "flourishing spring;" Kyson skins, refuse of tea (native term "tea skins"), coarser refuse (native term "tea bones.")

COFFEE ON THE BELLIGHERRY RUNGAN HILLS.—The high price realized for coffee last year (average of 103 to 108 shillings per cwt.) and the firmness of the market for the last two or three years, have induced speculators to invest more largely in coffee lands. Instead of buying up coffee estates of some standing, it is better to open out new coffee in new localities. "Bug," "leaf disease," and other pests make the upkeep of old properties more expensive than opening out fresh lands. We hear there are several applications for lands on the Belligherry Rungan Hills, Mysore Province, for coffee cultivation. At present a solitary planter—Mr. Morris—has opened out some 200 acres on these hills, but the search for fresh lands has induced several others to apply for blocks in this locality. We hear that Mr. Sanderson of Keddah fame purposes opening out coffee estates here.—*Bangalore Spectator*.

RUBBER CULTURE IN COLOMBIA.—A report by Mr. Wheeler, on the agriculture of Colombia, forwarded as a Consular report, by our Minister, and of the country, states—as we learn from a home journal—that various sorts of trees producing caoutchouc, mostly *castilloas*, are indigenous to Colombia, but only one sort is cultivated, and that, at present, to a very small extent. This is a hitherto undescribed species of the family of the *Euphorbiaceæ*, allied to the *Ceará* and the *Hevea* of Brazil, but it grows at greater elevation than any of the Brazilian species. In Chaparral there is a plantation of 70,000 trees, at 6,500 feet, which are doing well. They are ready for tapping in six years from the time of planting. This report lends additional interest to a communication which a M. P. Durand has recently made to the Paris Commercial Geography Society, in which he states that in April last he purchased 10,000 hectares (24,711 acres) of land at Monteria (Rio Sinu), Colombia, which is "incomparable" for cacao and rubber tree growing. He has since then planted a portion of the property with cuttings from the rubber trees in his neighbourhood, and hopes to hand over to his *société* in three years 100,000 young rubber trees which may be tapped from the sixth year.

A BUSY TEA FACTORY IN UVA.—It is not so long ago that some people thought that Uva would not be suitable for tea cultivation, but the experience of the last few years seems to show that as a tea-producing district it will be second to none. Nothing, for instance, can be finer than the tea on Glen Alpin estate, where as much as 400 and 500 lb. per acre is obtained off 4-year old tea, whilst the factory on that estate is turning out large quantities of tea. Up to date over 230,000 lb. of made tea has been turned out of it during the year, and by the 31st of this month, when the financial year closes, the total will have increased to 250,000 lb., of which a small proportion is bought leaf. We hear that a wire tramway 2½ miles long is about to be constructed from Badulla town to the estate, for the purpose of conveying manure from the town depot, where it is collected, to a point high up the estate, where it can be easily distributed. With a fine crop of coffee, with tea doing so splendidly, and with magnificent facilities for manuring, Glen Alpin ought to be a most valuable property for the shareholders of the Company.

"INDIAN CORN" is suggested by His Excellency the Governor as a product that ought to be freely cultivated in Ceylon, in his remarks to the people of Matale. This is a very natural thought to an Administrator who has seen how largely Indian corn forms the food of the people in the West Indies as it does in Brazil and other American States. And even in Ceylon, Sir Arthur Havelock will learn that maize or Indian corn is grown to a limited extent; and as we have repeated time after time in our "Agricultural Review" a great deal more should be done with it here in suitable localities. It requires however a moist good soil, although it has the widest range of all cereals. Bertolacci so far back as 1816 reported that "Turkish corn" or maize had been proved to succeed well in Ceylon: it was then grown freely in the Matara and Batticaloa districts and exported to other parts of the island. He hoped to see culture extend to the supersession of dry grain. There can be no doubt that much might be done in Ceylon to increase the production of maize, more particularly if better means of communication were established from Polgahawela and Dambulla, northwards and eastwards.

MINERALOGICAL.—Mr. George Armitage, to whom we referred the very pretty specimen of silver-like iron pyrites recently sent to us, in returning it states:—

"The bright faces are evidently the facets of the natural; crystal and judging from the angles, the crystal was I consider forming into a combination of the cube and tetrahedron, such as you will see figured in any good book on mineralogy."

A correspondent wrote to us:—

"No mention is made of *arsenic* in 'Gold, Gems, and Pearls.' I have been told that it exists in large quantities in parts of the island, and should be glad to know something about it as a marketable article."

On this head Mr. Armitage writes:—

"There is doubtless lots of arsenical pyrites in the island though I have not come across it. The ordinary pyrites does not contain arsenic. Arsenopyrite, mispickel, and arsenical pyrites which are different names for the same mineral, has a silver-white colour inclining to steel gray and is composed of arsenic, sulphur and iron with at times part of the iron replaced by cobalt. There are a lot of other minerals, such as sencopyrite, solingite, orpiment, realgar, &c., containing arsenic. I shall be glad to show anyone the specimen I have of arsenopyrites. It tarnishes outside, but shows the silver-white colour on a fresh fracture. Native arsenic is formed in veins in the crystalline rocks and often with ores of realgar, antimony, &c.

"*Re* your remarks about steatite in a recent *Observer*, it is I believe common in Ceylon. You sent me specimens to name on two occasions."

It seems doubtful if arsenic exists in a marketable form in Ceylon.

THE LAST CINNAMON SALES.

Cinnamon planters seem doomed to disappointment, not only through the absence of any material general improvement in the price of their spice, but especially in their efforts towards that end. The Chamber of Commerce in its last half-yearly Report, made pointed reference to this, as about the only native product which had not shared in the upward tendency which had been established with almost every other product. It was, however, hoped that a new experience was in early store for it, which would dawn with the next Quarterly Sales, which stood fixed for last Monday. The ground of the hope was the combination which Planters had entered into, to step the scraping of Chips; but so far has the hope been from realization that an actual fall in price has been registered. The experience is not dissimilar to that which puzzled producers when the initiation of more frequent sales was also followed by a fall in prices five or six years ago. The cause then was the combination of buyers in London to oppose every obstacle against proceedings which might imperil the monopoly which a few London Firms enjoy, of being the distributors to Europe and America of the finest kinds of Ceylon Cinnamon. The cause of the present disappointment is the continued failure to arrest production. Over-production being the very obvious cause of the fall in price of an article, the consumption of which cannot be stimulated by circumstances like those which operate with necessaries of life, the reasoning was that the cessation in the scraping of Chips, at least over a considerable area, would lead to a better demand for quilled bark, by reducing the total output. So far there has been no falling off in Exports. On the contrary, the current commercial year shows, up to last week, an actual increase in the quantity of bark shipped, both Quils and Chips' as compared with last year, while the diminution in the weight of Chips exported, as compared with the two previous years, has been compensated for by a material increase in Quills. The cause of low prices being thus yet in operation, it is not to be wondered at that the anticipated rise in price has not yet been realized. The following figures relating to the export of Cinnamon from 1st October to 20th February in the years named below, will explain how matters stand:—

Year.		Quills.		Chips.		Total.
1889-90	...	813,494	...	242,771	...	1,056,265
1888-89	...	929.296	...	242,771	...	749,153
1887-88	...	554,840	...	119,857	...	814,390
1886-87	...	701,127	...	259,550	...	1,045,444.

The foregoing table shows at a glance that the total Exports of Cinnamon during the current year are higher than in any of the three previous years, being 300,000lb. more than last year, and about 25,000lb. more than the year preceding. In the face of this it is unreasonable to expect a rise in price; but there is no reason to despair. True, the Chips shipped up to date this year are more than double the quantity for the corresponding period of last year, but the engagement not to scrap Chips had not full operation more than a quarter. Since then, as just before, the quickened demand for the article has led to all the available bark being rushed into the market. Not only cannot this be continued much longer with reference to the supply; but the ruling prices for Chips in London are a discouragement to the continuance of shipments thither at present local prices. Before many months elapse this will probably appear, there being further hope in the fact that, notwithstanding circumstances which have stimulated the output of Chips this year, the quantity of Quills shipped, far in excess of previous years, is more difficult of explanation. Probably, the season has been favourable for the harvesting of bark in some districts, and in others the necessities of growers, through low prices, have compelled them to cut all the bark they could; but it is to be feared there has been a gradual extension of the acreage under Cinnamon in village gardens. If this surmise be correct—in no other way can the large exports for years past be explained in the absence of new Estates—the fact shows with how small profits the Native grower can be content, and how difficult it is to compete with him in products which he can himself grow and prepare. We have often felt, and have to some extent experienced, how illusory are the projects which some benevolent people are fond of urging on others, of farming, fruit-growing &c. A scheme might look well enough on paper, but when account is taken of the fact that competition has to be faced with villagers to whom time is of no importance, who give their own spare labour, and who spend little or nothing on the upkeep of stock, buildings, &c., one should think twice before making small farming one's sole dependence.

The fall of ½d per lb. in low and medium kinds, referred to in the telegram received yesterday, added to tho fall of ½d to 1d experienced at the November sales, will be seriously felt by producers of low-priced medium bark. The heavier fall of 1d to 2d in fine bark, following a similar fall in November, must be a great disappointment to those who began to think the taste for superior bark had been fairly established. But we must not forget that, at the November sales, an exceptionally large quantity was offered; and although the 2,000 Bales catalogued this week, of which 1500 were sold, are below the previous offerings, they represent a full catalogue for this time of the year. We await further particulars by Mail; but meanwhile counsel Planters to be firm to their engagement not to resort to Chips. Before two years, the period of probation, shall have expired, it may be possible to record a victory.—Local " Examiner."

CEYLON EXPORTS AND DISTRIBUTION 1890.

COUNTRIES.	Coffee cwt. Plantation	Coffee cwt. N'tive	Coffee cwt. Total.	Cinchona. 1890 B'nch &Trunklb.	Tea. 1890 lb.	Cocoa. cwt.	Cardamoms. lb.	Cinnamon. Bales lb.	Cinnamon. Chips lb.	Coconut Oil. 1890 cwt.	Coconut Oil. 1889 cwt.	Plumbago. 1890 cwt.
To United Kingdom ...	43594	100	43694	4442693	27693859	7193	105046	523042	150306	9060	57070	72459
„ Marseilles	157	...	157	12500	547	79	...	45100	2800	...	...	...
„ Barcelona	...	...	...	...	...	...	...	22000	...	...	...	...
„ Genoa	12	...	12	...	1514	...	...	35725	11424	696	908	...
„ Venice	71	232	303	70412	755	...	...	4000	11200	...	...	...
„ Trieste	7825	...	7825	252	1130	...	...	3900	8848	3490	4611	...
„ Odessa	32	...	32	...	15	...	...	...	...	99	2211	...
„ Hamburg	296	...	296	...	30519	787	1131	146300	52772	9362	3707	22197
„ Antwerp	17	20	37	81057	115	...	...	7000	5600	304	1492	9409
„ Bremen	18	...	18	...	9559	151	...	14606	...	...	...	3632
„ Havre	...	100	100	...	...	...	...	10000	...	...	4578	...
„ Rotterdam & Amsterdam	3	...	3	21384	...	55	...	...	11200	10	...	1616
„ Africa	16	...	16	...	18720	...	...	5000	...	...	...	...
„ Mauritius and Eastward	174	212	368	...	25788	498	...	7500	...	35132	378	...
„ India	725	718	1443	...	71863	...	87571	5000	...	43238	13346	171
„ Australia & New Zealand	5639	869	6508	...	1204365	1	40	2260	...	1029	1737	242
„ America	1794	...	1794	186764	105833	1389	2271	64228	...	15028	62726	80942
„ Stockholm	...	...	.	...	173	...	...	...	...	...	...	...
Total Exports from 1st Jan. to 31st July 1890	60373	2251	62624	4815062	29164755	10370	196059	895661	254150	117448		190668
Do 1889	42015	3799	45932	5173737	20037992	9873	165772	1362563	338555	152764		235068
Do 1888	91080	3793	94972	7244095	13483711	9790	172261	848984	360507	202314		146927
Do 1887	126195	5373	131626	7714748	7247190	13374	202802	586622	146836	128810		144920

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's London Price Current, 17th July 1890.)

FROM MALABAR COAST, COCHIN, CEYLON, MADRAS, &c.	QUALITY.	QUOTATIONS.
BEES' WAX, White ...	Slightly softish to good hard bright ...	£7 a £8 15s
Yellow ...	Do. drossy & dark ditto...	95s a 115s
CINCHONA BARK--Crown per lb.	Renewed	3d a 1s
	Medium to fine Quill ...	4d a 9d
	Spoke shavings	2d a 9d
	Branch	1d a 3d
Red	Renewed	2d a 1s
	Medium to good Quill...	4d a 9d
	Spoke shavings	2d a 5d
	Branch	1d a 3d
	Twig	1d a $1\frac{1}{2}$d
CARDAMOMS Malabar and Ceylon	Clipped, hold, bright, fine	1s 8d a 3s
	Middling, stalky & lean	10d a 1s 6d
Alleppee	Fair to fine plump clipped	1s 4d a 3s 4d
Tellicherry	Good to fine ...	1s 3d a 2s 3d
	Brownish ...	9d a 1s 3d
Mangalore	Good & fine, washed, hgt.	1s 6d a 2s 8d
Long Ceylon	Middling to good... ...	6d a 2s
CINNAMON 1sts	Ord. to fine pale quill ...	$7\frac{1}{2}$d a 1s 7d
2nds	,, ,, ,, ,, ...	7d a 1s 4d
3rds	,, ,, ,, ,, ...	6d a 1s 2d
4ths	Woody and hard... ...	$5\frac{1}{2}$d a 11d
Chips ...	Fair to fine plant... ...	$2\frac{1}{2}$d a $7\frac{1}{2}$d
COCOA, Ceylon	Bold to fine hold ...	105s a 113s
...	Medium	95s a 103s
	Triage to ordinary ...	60s a 90s
COFFEE Ceylon Plantation	Bold to fine hold colory...	104s a 110s
	Middling to fine mid. ...	101s a 103s
	Low mid. and Low grown	95s a 98s
	Smalls	94s a 97s 6d
Native	Good ordinary	92s a 98s
Liberian ...	Small to bold	85s a 93s
East Indian ...	Bold to fine hold... ...	104s a 115s
	Medium to fine	100s a 105s
	Small	93s a 98s
Native	Good to fine ordinary ...	92s a 99s
COIR ROPE, Ceylon & Cochin	Mid. coarse to fine straight	£14 a £20 15s
FIBRE, Brush ...	Ord. to fine long straight	£15 5s a £28
Stuffing ...	Coarse to fine	£5 a £18
COIR YARN, Ceylon ...	Ordinary to superior ...	£13 a £30
Cochin ...	Ordinary to fine	£12 a £36
Do	Roping fair to good ...	£12 a £15
COLOMBO ROOT, sifted ...	Middling wormy to fine...	14s a 25s
CROTON SEEDS, sifted ...	Fair to fine fresh... ...	10s a 15s
GINGER, Cochin, Cut	Good to fine hold... ...	50s a 69s
,,	Small and medium ...	26s 6d a 38s 6d
Rough	Fair to fine bold	21s a 28s
... ...	Small	14s a 19s
GUM ARABIC, Madras...	Dark to fine pale ...	15s a 55s
NUX VOMICA ...	Fair to fine bold fresh ...	9s a 11s
	Small ordinary and fair...	6s a 8s 6d
MYRABOLANES Pale, ...	Good to fine picked ...	9s 6d a 10s 6d
	Common to middling ...	8s a 8s 9d
	Fair Coast...	8s 9d
Pickings	Burnt and defective ...	4s 9d a 6s 3d
OIL, CINNAMON ...	Fair to fine heavy ...	1s a 2s 6d
CITRONELLE ...	Bright & good flavour ...	$\frac{5}{8}$d a $\frac{3}{4}$d
LEMON GRASS ...	,, ,, ,, ,, ...	$1\frac{1}{2}$d a $1\frac{3}{4}$d
ORCHELLA WEED ..	Mid. to fine, not woody...	20s a 33s
PEPPER, Malabar, blk. sifted	Fair to bold heavy	$4\frac{7}{8}$d a $5\frac{1}{4}$d
Alleppee & Cochin ,,	,, good ,,	
Tellicherry, White ...	,, ,, ,, ...	1s $1\frac{5}{8}$d a 1s $2\frac{1}{8}$d
PLUMBAGO Lump ...	Fair to fine bright hold...	15s a 19s
	Middling to good small...	11s a 14s
Chips ...	Slight foul to fine bright	9s a 12s
dust ...	Ordinary to fine bright ...	5s a 9s
RED WOOD	Fair and fine hold ...	£4 10s a £4 15s
SAPAN WOOD ...	Middling coated to good	£5 a £8
SANDAL WOOD, logs ...	Fair to good flavor ...	£30 a £58
Do. chips ...	Inferior to fine	£9 a £30
SENNA, Tinnevelly ...	Good to fine hold green...	5d a 8d
	Fair middling medium...	2d a 4d
	Common dark and small	1d a 2d
TURMERIC, Madras ...	Finger fair to fine bold	15s a 17s
Do. ...	Mixed middling [bright	14s a 15s
Do. ...	Bulbs	10s a 12s
Cochin ...	Finger	10s a 11s
VANILLOES, Mauritius & Bourbon, 1sts	Fine crystalised 6 a 9inch	16s a 23s
2nds	Foxy & reddish 5 a 8 ,,	13s a 18s
3rds	Lean & dry to middling under 6 inches ...	8s a 11s
4ths	Low, foxy, inferior and [pickings	3s a 7s
FROM BOMBAY AND ZANZIBAR.		
ALOES, Socotrine ...	Good and fine dry ...	£4 a £7
Zanzibar & Hepatic...	Common and good ...	40s a £5 5s
CHILLIES, Zanzibar ...	Fair to fine bright ...	33s 6d a 36s
	Ordinary and middling...	30s a 33s

FROM BOMBAY AND ZANZIBAR.	QUALITY.	QUOTATIONS.
CLOVES, Zanzibar and Pemba, per lb	Good and fine bright ...	$5\frac{7}{8}$d a $6\frac{1}{8}$d
	Common dull to fair ...	$5\frac{1}{4}$d a $5\frac{3}{4}$d
Stems...	Common to good ...	$1\frac{1}{4}$d a $1\frac{3}{8}$d
COCULUS INDICUS ...	Fair ...	8s 6d a 10s
GALLS, Bussorah & Turkey ℔ cwt.	Fair to fine dark blue ...	52s 6d a 57s 6d
[cwt.	Good white and green...	40s a 50s
GUM AMMONIACUM per	Blocky to fine clean ...	20s a 50s
ANIMI, washed, ℔ cwt.	Picked fine pale in sorts,	£12 a £13 10s
	part yellow and mixed	£8 a £11
	Bean & Pea size ditto ...	£5 a £8 10s
	amber and red bold ...	£8 a £11
scraped...	Medium & bold sorts ...	£4 a £7
ARABIC E.I. & Aden ..	Sorts	32s a 75s
per cwt. Ghatti ...	Sorts to fine pale ...	20s a 70s
Amrad cha	Good and fine pale ...	50s a 65s
	Reddish to pale brown ...	25s a 45s
ASSAFŒTIDA, per	Clean fair to fine ...	26s a 38s
cwt.	Slightly stony and foul ...	16s a 25s
KINO, per cwt.	Fair to fine bright ...	25s a 30s
MYRRH, picked ,,	Fair to fine pale ...	£5 a £6 10s
Aden sorts	Middling to good ...	72s 6d a 80s
OLIBANUM, drop	Fair to fine white ...	35s a 55s
per cwt. ,,	Reddish to middling ...	25s a 34s
pickings...	Middling to good pale ...	12s a 20s
siftings ...	Slightly foul to fine ...	10s a 15s
INDIARUBBER Mozambique,	red hard ...	2s a 2s 6d
per lb. Ball & Sausage	white softish ...	1s 5d a 2s
	unripe root ...	1s a 1s 11d
	liver ...	1s 3d a 2s 3d
FROM CALCUTTA AND CAPE OF GOOD HOPE.		
CASTOR OIL, 1sts per lb	Nearly water white ...	4d a $4\frac{1}{4}$d
2nds ,, ...	Fair and good pale ...	$3\frac{5}{8}$d a $3\frac{3}{4}$d
3rds ,, ...	Brown and brownish ...	$3\frac{1}{4}$d a $3\frac{1}{2}$d
INDIARUBBER Assam, per lb.	Good to fine ...	2s a 2s 6d
	Common foul and mixed	9d a 1s 10d
Rangoon ...	Fair to good clean ...	2s a 2s 4d
Madagascar	Good to fine pinky & white	2s 4d a 3s
	Fair to good black ...	1s 11d a 2s 2d
SAFFLOWER ...	Good to fine pinky ...	60s a 70s
	Middling to fair ...	40s a 60s
	Inferior and pickings ...	15s a 25s
TAMARINDS ...	Mid. to fine *black* not stony	10s a 12s 6d
	Stony and inferior ...	4s a 6s
FROM CAPE OF GOOD HOPE.		
ALOES, Cape, per cwt. ...	Fair dry to fine bright ...	22s 6d a 24s 6d
,, ...	Common & middling soft	12s a 21s
Natal ...	Fair to fine ...	none here
ARROWROOT Natal per lb.	Middling to fine ...	2d a $3\frac{1}{4}$d
FROM CHINA, JAPAN & THE EASTERN ISLANDS.		
CAMPHOR, China, ℔ cwt.	Good, pure, & dry white	160s
Japan ...	,, ,, pink	
GAMBIER, Cubes, cwt. ...	Ordinary to fine free ...	38s a 41s
	Pressed	nominal
Block [per lb.	Good ...	27s 3d
GUTTA PERCHA, genuine	Fine clean Banj & Macassar	3s 6d a 4s 6d
Sumatra...	Barky to fair	2s a 3s 4d
Reboiled...	Common to fine clean ...	4d a 2s
White Borneo ...	Good to fine clean ...	1s 10d a 2s 9d
	Inferior and barky ...	1s 4d a 1s 9d
NUTMEGS, large, per lb...	57's a 80's, garbled ...	2s 10d a 4s
Medium ...	83's a 95's ...	2s 8d a 2s 9d
Small ...	100's a 160's ...	1s 6d a 2s $7\frac{1}{2}$d
MACE, per lb. ...	Pale reddish to fine pale	2s 8d a 3s
	Ordinary to fair ...	2s 3d a 2s 6d
	Chips and dark ...	1s 6d a 2s
RHUBARB, Sun dried, per lb.	Good to fine sound ...	1s 3d a 3s 2d
	Dark ordinary & middling	8d a 1s 3d
High dried ...	Good to fine ...	9d a 1s 1d
	Dark, rough & middling	3d a 7d
SAGO, pearl, large, ℔ cwt.	Fair to fine ...	17s a 18s
medium ...	,, ,, ,, ...	15s a 17s 6d
small ...	,, ,, ,, ...	10s 6d a 12s
Flour [per lb.	Good pinky to white ...	8s a 12s
TAPIOCA, Penang Flake	Fair to fine ...	2d a $2\frac{3}{8}$d
Singapore ...	,, ,, ...	2d a $2\frac{1}{2}$d
Flour ...	,, ,, ...	10s a 15
Pearl ...	Bullet, per cwt. ...	21s a 22s
	Medium ,, ...	17s a 18s
	Seed ,, ...	16s a 17s

THE MAGAZINE

OF

THE SCHOOL OF AGRICULTURE,

COLOMBO.

Added as a Supplement monthly to the "TROPICAL AGRICULTURIST."

The following pages include the contents of the *Magazine of the School of Agriculture* for August :—

PLANT FOOD AND ANIMAL FOOD.

IT is a common error to suppose that chemical analysis, and this alone, is necessary for finding out the nature of manures to be applied to crops, and the nature of foods to be supplied to animals. It was one of the unfortunate results of the teaching of Liebig that agriculturists came to believe that when the composition of the ash of plants was ascertained, farming would be reduced to a simple equation :—Given the elements of the soil and the composition of the plant, required the manure. They now know, however, that there are other considerations to be taken into account in deciding what manure should be supplied to a crop. The leguminosæ, for instance, are found by analysis to be rich in nitrogen, and yet nitrogenous manures produce but little effect on leguminous crops: while, though the cereals are most benefited by nitrogenous manures, they contain less nitrogen than roots and leguminous crops. Thus the composition of the crop is not a sufficient guide to the character of the manure to be applied, even when the analysis of the soil on which it is grown is known. We require to know in addition the power of the crop to assimilate the ingredients of plant food.

In the same manner there are other considerations besides the chemical composition of the food supplied to animals which must influence our selection of food-stuffs. Just as the food ingredients of the plant may be present in the soil in a condition in which they cannot be made use of, so also may the nitrogenous and non-nitrogenous parts of food exist in a form in which little nutriment is derived from them by animals. For a long time all the nitrogen in the food of animals was supposed to be in the form of albuminoids; but during the last few years it has been shown that a part of the nitrogen of vegetable foods exists not as albuminoids, but as amides, and, in some cases, as nitrates. Thus it is quite possible that a food which was supposed to contain more albuminoids (reckoning all the nitrogen as albuminoids) than another, may turn out, when the true albuminoids only are taken into account, to be inferior in value. Having ascertained the amount of true albuminoids, we are able to find the "albuminoid ratio," that is the proportion of digestible albuminoids to digestible non-albuminoids in food. For the best feeding results a certain proportion between these two must be observed: and it will be readily admitted that to supply animals with an unlimited amount of food without considering the ratio of albuminoid matter to carbohydrates will not give us the best feeding results. The results of the analyses of vegetable foods are generally given under the heads of water, nitrogenous substances (the albuminoids being reckoned separately), fat, soluble carbohydrates, fibre, and ash. In calculating the albuminoid ratio the fat is reduced to its equivalent in starch by multiplying by 2·5, and the result is added to the soluble carbo-hydrates. The most important consideration in the matter of feeding, however, is the digestibility of foods, which can only be ascertained by experiment; and the general method adopted is to supply an animal with weighed quantities of food, the composition of which is known, collect and weigh the solid excrements and analyse them, and thus obtain almost the exact amount of

each constituent of the food which has passed through the animal unabsorbed, and by difference the amount digested. The proportion of each constituent digested for 100 parts is known as the "digestion co-efficient." There are some foods which, though chemical analysis proves, they have less of the valuable ingredients of food than others, are superior to these latter from the fact that they show a larger digestive co-efficient. For instance, linseed cake from the large proportion of fats and albuminoids which it contains would be expected to occupy a higher position as a heat-producing food than maize; its lower rank is due to its less perfect digestibility.

The necessary proportion of albuminoids to carbo-hydrates in the food of animals is analogous to the proportion of food ingredients necessary for the healthy growth of plants. Plants will not take up any more of an ingredient that is supplied to them in excess than they require in order to maintain the proportion to be observed between the amounts of the various elements of food. As different species of animals require different kinds of food, that is foods of different composition, so plants too require the ingredients of their food to be supplied in different proportions. Some take in more of one element of food than another; while some are able to attack substances in a little soluble form, as some animals have a greater power of assimilating little digestible parts of food.

There are yet many considerations to be taken into account, such as the influcnce of one element of food on another. The presence of an excess of water results in a certain amount of waste of the nitrogenous part of food; the addition of oil to a diet of fodder results in most cases in improved digestion; common salt hastens the conversion of starch into sugar. The digestion of vegetable fibre differs in different animals, and according to the source from which it is derived. Cattle and sheep have the greatest power from the fact of their being ruminants, horses and pigs come next, while poulty seem to have no power of digesting vegetable fibre. Flavour, too, has a great influence on diets; an agreeable flavour stimulates the appetite and promotes digestion. The reason for sowing a small quantity of yarrow with pasture grasses is no doubt this, and the fact of cattle greedily devouring bracken ferns and thistles after being made into silage that has acquired an agreeable flavour from fermentation, amply proves it. Even smell has some influence on appetite. The sweet smell of *anthroxanthrum odoratum* in hay is greatly appreciated by cattle, though the grass is not very palatable and by no means very nutritious; while the aversion of cattle for fodder contaminated by the excrements of their own species is evidently owing to the peculiar odour it has acquired.

Thus the feeding of animals with the best results must be looked upon as an art that requires the help of chemistry, and calls for a knowledge of the results of experiment and observation by no means limited. And it is the total ignorance, or utter neglect of the principles of feeding animals that are specially intended for drawing heavy loads, laying on beef, and secreting milk, that has brought the cattle of this country into the degenerate condition in which we find them.

INDIGENOUS FOOD PRODUCTS: CULTIVATED AND WILD.

By W. A. De. Silva.

Sapindaceae.

22. *Schleichera Trijuga* Wild; Sin. Kón.

This is a tree common in the warmer parts of the Island. It attains very large dimensions, but the special feature of a Kón tree is the dense mass of foliage which covers it. The stem is thick and has a hardy appearance, the bark being grooved as it were. The main branches are few, but the minor branches are many. The dense leaves of this tree are compound (pinnate), and the leaflets have entire margins with prominent veins: in general, the leaf may be said to have a desiccated appearance. The trees shed their leaves once a year, after which young leaves begin to spring up. The young leaves of the Kón tree are of a pink hue, whilst the ordinary ones are of the usual green colour. The fruits are borne once a year in large bunches containing hundreds of them. They are round and small, about the size of small marbles, and are covered with a rather brittle leathery pericarp of a dusty colour. The mesocarp is a succulent mass of pulp encircling the seed. This succulent mass is of a yellowish colour and contains an acid substance. When unripe it is very acid and also has a little astringent taste, whilst when fully ripe the astringency is replaced by a sweeter taste, and the acid character too disappears to a certain extent.

This pulp is much eaten when ripe, and where-ever the trees are met with, the fruits are not allowed to waste. In some places they become a marketable article where a hundred is sold for a few cents. The pulp of the Kón fruit is also made into curries and eaten along with rice, but this curry, though liked by some, is not to the taste of many on account of its acid nature. A palatable jam may also be prepared from the pulp of this fruit by boiling it in a syrup. A large quantity of oil is found in the seeds of *Schleichera,* and is extracted in some parts of the Island and used for burning. It is also said that a considerable quantity of lac is produced in the young branches.

The timber of this tree is known as the Ceylon oak. It is very durable as well as elastic, on account of the latter property the wood is in much demand for making native oil mills (chekkús), and for many other purposes as planks, beams, &c.

The medicinal properties of this plant unlike many other native plants are known to be of a definite nature, as the juice expressed from the leaves is always recommended for disorders of the brain, giddiness, biliousness, &c.

23. *Nephelium Longana* Cam.; Sin. Mora.

This tree very much resembles the one described before, but it does not appear to be of such a hardy character. The leaves are greener in appearance and the fruits are smaller. The epicarp or the outer covering of the fruit is leathery and smoother than that of the Kón. The mesocarp which surrounds the seed is of a blackish tint, and instead of its being sour as in the Kón, it is of a very sweet taste rather more than is pleasant. The fruits when ripe have a smell of ether. Bats are very fond of this fruit, and it is difficult to preserve them from their attacks. The fruit is eaten much and is in demand always. The seed is of a very black colour and light, and it

does not contain oily matter to any appreciable extent. The timber is also good, and is used for a variety of purposes especially in building.

The bark of this tree is used in cases of mild fever, and the fresh juice is reputed to be a successful remedy in curing earache.

OCCASIONAL NOTES.

We have before us Bulletin No. 6 of 1889-90 of the Agricultural Department, entitled "South Indian Fodders." This paper consists of a series of analyses of the chief kinds of straw on which the cattle of the Madras Presidency are fed, with explanatory remarks appended; and the work is that of Dr. VanGeyzel, M.B., C.M., F.C.S., F.I.C., Chemical Examiner, Madras. After giving the average composition of the straw of paddy (*Oryza sativa*), Cholum (*Sorghum Vulgare*), Ragi (*Eleusine corocana*), Cumbu (*Penicillaria Spicata*), Varagu (*Paspalum Scrobiculatum*) and, for the purpose of comparison, analyses of English and American wheat and oats, English Barley and American Maize, he remarks :—"The first point to observe is the apparently extraordinary poverty of the Indian straws in albuminoids. This brings down the "albuminoid ratio" in all cases to a figure much below that given for any English or American fodders. That this is misleading will, however, be evident, if the nitrogen found in the non-albuminoid compounds be calculated in the usual way into albuminoids, and the nutritive relation worked out on the result. The results are then, except in the solitary case of the analysis of oat straw where the non-albuminoid nitrogen is separately given, generally much more favourable to the quality of Indian fodders. In comparison with the English and American straws shown in the table, and judged by the figures representing the "albuminoid ratio" (*i.e.*, the total nitrogen being regarded as albuminoid); the South Indian fodders examined do not appear to be inferior; they also compare favorably in respect of the total amounts of nutriment contained in them, viz., the sum total of albuminoids, the starch, and the starch equivalent of fat, excluding the fibre, which is in this case usually regarded as non-assimilable. What proportion of the total nutriment is actually assimilable being unknown, it would be unsafe to condemn these fodders, though regarded absolutely as food in the light of their albuminoid ratios, the analysis show that these fodders, on which South Indian cattle mainly depend are not of high value. Of the fodders generally obtainable, ragi straw appears to be the best, while varagu and cumbu straw are but little inferior to paddy straw, and cholum straw is the worst."

So far back as 1869 we find Mr. Laurie, the Director of Public Instruction at that date, suggesting in his Special Report on the state of Public Instruction in Ceylon, that "an Agricultural class should be initiated in connection with each school," and recommending the appointment of "a Master of Design and Technical Science." The carrying out of the former project, however, was left to the energy and determination of our present Director, who, we doubt not, will not rest satisfied till he sees the latter suggestion also *un fait accompli*.

From the Director of Public Instruction's report we quote the following:—"There are now altogether eleven Schools of Agriculture in Ceylon; that is to say, there is the parent Colombo School of Agriculture, which I opened in 1884, and there are ten branch institutions officered by young men trained in the parent school, the object of which is to spread into the districts the knowledge hitherto confined to those who came in to Colombo to the parent school.

"In 1887, the first of their existence, there were only six branch schools. The progress is therefore satisfactory, especially when it is considered that the government continues to pay for only six Agricultural Instructors; but the Government Agents of the Eastern and North-Western Provinces, of Sabaragamuwa, and Kegalla have come forward, recognising the usefulness of my Agricultural Instructors, and have themselves arranged for the payment of the four new Agricultural Instructors, who are usually attached to ordinary Schools, giving a few hours of theoretical instruction each week during the School Session, and, with the help of the bigger boys and such labour as they may engage on hire, cultivating plots of land upon improved principles. The profits are divided into two halves. Half goes to the Instructor and the remaining half divided amongst the boys who work on the paddy-fields or highlands cultivated. These lands are re-rented and paid for, so that my Instructors may be in no better position than the native cultivator, excepting that they cultivate on improved principles. Otherwise the native cultivator would lay our success down to having free government land."

Mr. Dunstane, a well-known American Naturalist, has brought back from Central America some horrible details of the "la sagenas de diable," the devil's snare, a plant or vine composed entirely of bare, interlacing stems of a very dark hue and covered with a thick viscid gum that exudes from its pores. There are many stories current in the vicinity of Nicaragua lake, where the plant is found in the swamps of San Sebastian, of human victims to its voracity. These must be taken for what they are worth; but as to the carnivorous nature of the plants there seems little doubt, for Mr. Dunstane had this proved to his satisfaction by the attack made on his dog, and on his own hand, while attempting to rescue the animal. The meshes of the vine were found to twist and twine in a most life-like fashion whenever anything came within their grasp, and from experiments made with raw meat &c. it was found that whenever any animal matter came within reach, it was sucked dry of its blood in a few minutes and then thrown aside. The gummy secretion seems to serve the purpose of increasing adhesion and overpowering the victim by its nauseating odour.

We are in receipt of the annual report of the Department of Mines, New South Wales, for the year 1889—a voluminous Blue Book of 253 pages. From it we find that the number of applications dealt with in 1889 amounted to 4,155, of which 1,640 were for gold leases comprising an area of 13,768 acres, and 2,515 were for mineral leases covering an area of 160,700 acres. The number of appli

cations for leasing crown lands for mining purposes (including applications for special gold leases) for 1889 falls short of that for 1888, which, however, was quite an exceptional year. The minerals to be mined for comprise gold, silver, copper, lead, tin, antimony, cinnabar, iron, cobalt, bismuth, crome, ochre, plumbago, diamonds, coal, marble, slate, manganese, kerosine, and alum. The geological survey of the Colony is progressing rapidly under the two geological surveyors, Messrs. David and Anderson, and by their work not only are the hidden stores of coal and the wealth of minerals being reached, but a knowledge of the geological history and formation of the Colony is being gathered, while most useful palæoutological work is being prosecuted under Mr. Etheridge.

The report of the Director of Botanical Gardens for 1889 was published in June, and the accounts of the Gardens at Peradeniya, Hakgala, Badulla, Henaratgoda and Anuradhapura show how much is being done by Dr. Trimen for the improvement of these places, and the highly satisfactory condition to which he has brought them. The foundation of a Museum in the Peradeniya Gardens will supply a long felt want; and already a good start has been made with a splendid collection of Ceylon woods. It is a great consideration that lovers of gardening are able to secure such plants as are available in the nursery at a very moderate price, but it is very desirable that some responsible person should be stationed at the lodge by the gateway, who can receive payments for plants purchased. As it is, the coolies who carry the plants are authorised to receive money, and it has happened on more than one occasion that they have disputed about prices which had been previously arranged, and endeavoured to extort more than the value of the plants. Neither these men nor the gatekeeper it appears can be commended for their civility to visitors, and this, as occurring in a public resort so largely frequented by foreigners, is a matter of regret, and calls for redress.

A caterpillar, said to cause serious damage to the coconut tree in Batticaloa, was sent to us with some affected leaves. The caterpillar appears to feed on the softer tissues of the coconut leaves which it rolls up into cylinders spun together by its threads. It feeds within these cylinders. leaving the epidermis intact, which give to the leaves that scorched up appearance which is characteristic of trees attacked by the caterpillar.

The caterpillar is about half an inch long, of a slightly greenish colour when young, but becomes rosy when full grown. It has a dark red line along the back and along each side, and a brown head. The back of the segment behind the head is also brown. When full fed the caterpillar turns into a chrysalid, of a deep brown colour, in the folded leaf.

The parent of the caterpillar above described is about a little more than three-quarters of an inch in the spread of its wings, shiny, of a pale ashy colour, the upper wings freckled with darker spots. The under wings are of a yellowish grey, satiny, and fringed. The moth may be known by its long and narrow upper wings being laid flat one over the other when at rest, and by the abdomen being depressed or flat. It evidently belongs to the genus *Depressaria*, commonly called the flat-body moths. It is not figured in "Moore's Lepidoptera of Ceylon," and we shall name it temporarily *Depressaria Cocos Nucifera* (?). We hope to give an illustration of the moth in our next.

WATER-LIFTS.

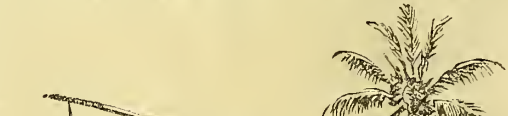
By Aba.

The restrictions put upon chena cultivation by the authorities, and its natural decline owing to the scarcity of forest land to carry on this pernicious system of cultivation makes it desirable to extend the cultivation of those crops which have hitherto been grown on chenas, under wells in parts of the Island where tanks do not exist.

This branch of husbandry is carried on extensively in India where the ryot is enabled to grow his crops during the dry weather or in droughty seasons, and indeed it has been said that "it is also the one practice in native farming to which most care and intellegence is devoted."

The invention, application and introduction of economical means of raising water from wells belongs more properly to the subject of Mechanical Engineering, but the object of this paper is to lay before my readers a description of the three modes of raising water from wells in general use in India.

I. The *Picotta* or *Latha*, the water-lift common to all Oriental countries, is a lever with a bucket at one end attached by means of a pole, and a counterpoise at the other. It works very well and cheaply too for lifting water under 12 feet, but above that height it becomes expensive. It is worked by two men who will work at it from 6 to 8 hours and raise about 700 cubic feet of water



I. The Picotta or Lever Water-lift.

from a depth of 11 feet. This kind of lift is not unknown in Ceylon. It is used for raising water from wells in the public bathing places of Colombo, and to some extent in the irrigation of tobacco and other crops in Jaffna, and a few other places by the Tamil inhabitants.

The following calculations are from *Professional Papers*, Vol. I.

Water raised 16 ft. Content of bucket=·45 c. ft. No. of discharges per minute=3. Discharge per hour=81 c. ft.

Actual discharge per hour=72·9 c. ft.=455·4 gallons.

(To be continued.)

ABOUT THE GROWTH OF TREES.

Dr. William Somerville who made a special study of Sylviculture in Germany,—where so great attention is paid to this subject,—and who was last year appointed lecturer on Forestry in the University of Edinburgh, has published a most useful paper on the growth of trees: in which the results of foreign workers are noted. That the crude sap of trees ascends by the wood, and that the elaborated sap descends by the bast, he says, can be well proved experimentally. If a ring of bark (which contains the bast) be removed from a tree at the height of a few feet from the ground, and if the stem below be destitute of branches, no growth will take place below the ring after the first year—the little that does take place being due to the consumption of reserve materials; above the rings ordinary growth takes place. The upward flow does not support cambium activity, and is thus practically not plant food till it is elaborated in the leaves.

Death of a "ringed" tree however will occur before very long owing (1) to the death of the exposed alburnum under the action of minute fungi, or (2) what usually puts an end to it, the death of the root hairs which are no longer nourished owing to the check given to the downward flow. This can be proved by ringing one of the limbs of a forked stem. The behaviour of this limb will be similar to that of the stem, only that the tree will continue to grow for a much longer period, for the limb or limbs which were not ringed will send down nourishment to the root to keep them healthy so as to send up water and mineral matter.

Under the most favourable conditions of growth a tree produces more nutriment than is actually required to supply the want of the cambium. If a cross-section of a healthy tree be examined with the microscope, it will be found that the cells of the medullary rays as well as certain cells lying parallel to the axis of the stem hold large quantities of reserve food, especially starch, these being scarcely found near the centre of large trees, but abundantly so towards the outer parts especially in the alburnum. Experiment tends to prove that the capacity to bear seed is regulated by the amount of reserve materials collected by the tree.

The almost total absence of starch in duramen, and its presence in alburnum, is a circumstance connected in a very direct manner with the difference in durability of these two parts of tree. It is well known that the outside wood has not the same power of resisting the attacks of fungi as the wood lying nearer the centre. The fungi which cause decay cannot live without food, and the food best suited to the growth and development of many fungi is just the kind found in the storehouse of the tree. When the spores germinate on heartfood the young fungi do not find the means to sustain life and quickly die; whereas in the sap-wood all is present that they require, and consequently if moisture and heat be forthcoming, rapid increase takes place and the wood is soon destroyed. The absence of starch from the duramen is not the only cause of its greater durability—the depositions of gums, resins, &c., being even more influential.

In an annual ring of wood the spring-wood is known to be not so firm as the autumn-wood. The preponderance of the latter it is that regulates the specific gravity of woods, and specific gravity is probably the best test which can be conveniently applied to discover their quality. Two theories have been advanced to account for this peculiarity of this wood-ring. The older and more generally accepted one is known as De Vries and Sachs' "Bark-pressure Theory." Put shortly it is as follows:—In winter owing to the mollifying action of water, to its freezing and thawing, and to changes of temperature generally, the bark is considerably loosened, so that in spring when activity of the cambium recommences, much less pressure is offered to the growth of new cells than is the case in the latter parts of the season, when the bark presses on the cambium very tightly, owing to the wood having increased in volume. In the early part of a growing season the cambium rapidly produces wood under reduced pressure, the wood being consequently very porous, whereas in autumn the wood produced is very dense, because the cambium is then working under greater pressure. The other and newer theory may be called Hartig's "Nutrition Theory," according to which the spring-wood is not so firm as the autumn-wood, because, in the early part of a growing season, the conditions are not present which enable a tree to assimilate rapidly, and therefore there is not so much plant-food available for the formation of cell-wall materials.

An argument in support of the "Bark pressure theory" is, that if the pressure on the cambium be relieved, naturally or artificially, the part of ring formed at the point of relief is broader than any other. For example, if the outside rings of a section of an old thick-barked stem be examined, it will be seen that they do not follow a regular course, but pursue a more or less undulating one. A careful examination will show that the points of swelling correspond to places where deep fissures occur in the bark, that is to say, places where pressure is reduced—while the points where the rings bend in towards the centre correspond to places where the bark is firm and entire. The same thing may be seen on a larger scale, where by any means a tree has been longitudinally cracked. If the rupture is of long standing, the circular

character of a cross-section is more or less departed from, for, owing to the excessive growth in the neighbourhood of the cracks, induced by reduction of the pressure on the cambium, the tree shows a striking protuberance on that point.

THE PLOUGH AND DRAUGHT ANIMALS

One great objection raised at first to the use of the Improved Plough in paddy cultivation was that the weak and puny cattle commonly used by our farmers could not draw the heavy iron implement. But this objection has been in a large measure met by the introduction of light ploughs, such as the "Vitis" and the "Cingalee" made by Messrs. Howard & Co. at Bedford, and the "Indian Ryot" and "Patent Pipe" ploughs by Messrs. Massey & Co. at Madras. These ploughs, while they retain the mould-board &c. essential for the inversion of the soil, are much in keeping with native taste in point of lightness, and in having a single handle so as to admit of being worked without an extra driver. But still native farmers will complain that the draught animals find it more tiresome to draw these new ploughs; and this is not to be wondered at when we see that the work done by the iron plough is more thorough by far than that done by the wooden village ploughs or rather cultivators.

But this state of things naturally suggests that improvement is needed in the other direction as well:—I mean in the draught animals. And how is this to be done?

1. The importation of stronger foreign breeds of cattle might be suggested. But this can only be done by rich farmers who can afford the purchase and upkeep of these animals.

2. Again we might obtain better draught cattle by crossing our country ones with some suitable foreign breed. This can be done even by the poorer class of farmers, provided they can get the opportunity of crossing their cows with superior breeding bulls belonging to their richer neighbours. Such bulls are not, however, so common here as they ought to be; and this method of obtaining improved draught cattle could only be effected gradually. Some of our rich native landlords have indeed, I am aware, imported good strong foreign cattle, and the services of their breeding bulls are, I believe, readily lent when applied for. But as yet this sort of improvement is being carried on only to a very limited extent, and there seems no likelihood of its being extensively adopted in the near future.

3. While the two previous methods of obtaining superior draught animals are very good in their proper place, it is easier by far, and is practicable by both rich and poor alike, to make the most of the animals which are to be had at present in our country, and which are already in use.

The improved plough demands a greater draught as it turns over the soil; and therefore the cattle should be fed with good nourishing food so as to nerve them up for the work. Forage crops must be grown; and fodder must be suitably preserved for dry weather.

All animals used in breeding stock for draught purposes should be carefully selected and properly fed.

Improvement is also possible in the method the animals are yoked to the plough. It has been suggested to me by a European Government official in Jaffna that the animals should be yoked so as to place the line of draught more horizontally, as in the case of the harnessing of horses. This method of yoking would balance the weight properly on the body of the animal, and enable it to use its full force in effecting the draught. This would be especially true in the case of the buffalo. It has no hump; and it is very clear that when provided with a collar such as is used for the horse, the buffalo would draw the plough much better than it now does. Of course a little extra training might be necessary then. In China the plough is drawn by a single buffalo or ox harnessed in this manner. What might we not expect then from a pair of huge strong village buffaloes when their draught power is economized in this way to the best advantage?

Haputale. E. T. Hoole.

(To be continued.)

[The force "absorbed" by the different parts of an ordinary swing plough has been calculated as follows:—

Resistance by Share & Coulter	44	per cent
Sole-friction	15	"
Friction on land side, *i.e.* on cheek plate	35	"
Mould-board	6	"

The directions of resistance are in 3 planes: (1) Perpendicular as in cheek-plate, (2) Horizontal as in sole, and (3) Curved, following surface of mould-board.—Ed.]

NOTES FROM A TRAVELLER'S DIARY.

The cultivation of cocoa, in districts where the tree thrives, by natives who have the land, is a commendable industry. In Lower Dumbara, for instance, the natives go in a good deal for cocoa-growing. A full-grown tree will yield on an average nearly Re 1 a year, and three hundred trees will more than supply the wants of a family possessing an acre of land.

Now that coffee is allowed to grow under less artificial conditions than it used to, the trees (and particularly those growing under shade) look quite robust, and are not affected with leaf disease to any appreciable extent, while a splendid crop of berries is generally to be seen. In fact some proprietors are planting coffee, and I have seen the old discarded pulping machines being brought into requisition once again.

My attention was drawn to a tract of paddy land bordering the Rattota road, about 3 miles from Matale, and reputed to have very fertile soil. At the time I visited the place, the ground was almost completely covered over with a growth of weeds known in Sinhalese as *Peti-thora*, the botanical name of which is *Cassia Occidentalis.* The plant belongs to the order leguminosæ, and it struck me that it was more than probable (from the fact that the plants of this order have the peculiar property of fixing nitrogen from the atmosphere and accumulating it in the soil) that the fertility of the soil may be due to the land lying periodically fallow under a crop of these weeds. *Peti-thora* is commonly met with in most parts of the Island, and if experiment confirm my theory, it would be an inexpensive

and commendable means of improving poor soils to have land under a crop-fallow of this plant and use the crop as green manure. The leaf of the plant is sometimes made into a curry by the natives.

A good many goiyas attribute their unfortunate condition to coffee-cultivation for more than one reason. They depended too much on coffee in its good days, and neglected their paddy-fields, and now that they are obliged to return to paddy cultivation, they find that owing to the destruction of forests (the influence of which they are intelligent enough to recognise) the streams which once fed their *êlas* have dried up, and they are unable to get a sufficient supply of water to irrigate their fields at the proper season.

At the time of the native Rajas, they say that a man who possessed a very small area of paddy land—even a *pêle* sowing-extent—had his *viatuwa* or paddy-barn for storing the grain. At that time, too, his wants were few, and he lived, what seemed to him, in affluence. Now, however, owing both to small returns and the comparatively expensive habits of life he acquired in the prosperous days of coffee, he finds it a difficult problem to make both ends meet. Once a palm-leaf was a sufficient protection from the sun, now he must have his umbrella and such articles of apparel to which his so-called civilization has introduced him. The apathy generated by the luxurious life of the past clings to him still, and while he can, if he is industrious, make a comfortable living out of arecanut, pepper or cotton, he is unequal to the effort.

INDIAN CORN.

Zea Mays of the natural order *Graminaceæ*. It is also called maize and Turkey corn. The male and female flowers are found on the same plant (hence monœcious). The male blossoms are produced in elegant loose wavy spikes at the summits of the stems, some of a cream colour, other varieties with a limit of red.

The fertile flowers are produced from a compound sheath arising from the bosoms of the leaves, deep set in their axils; they are two, three or more in number on each plant. The corn is arranged in upright or spiral ranks, firmly embedded in a receptacle which is termed the cob.

This is sufficient to convey some idea of the botanical character of this truly interesting and beautiful plant; and as it has lately been spoken of and noticed as worthy of attention, I am impelled to take up this subject with which I am familiar. As His Excellency the Governor desired the people of Matale to grow Indian corn, and the season of the year is somewhat favourable to the setting apart and preparation of an experimental plot, I think it advisable to adduce so much of my own experience as may enable those who are interested in the attempt to make a trial of a method which cannot mislead.

1. Select the best and softest loam of the garden. Such a soil is always fertile if duly tilled, and to none is it better suited than to maize, particularly if the site be open and fully exposed to the sun.

2. At any favourable period during the early part of the year, make trenches three or four feet asunder, taking out six inches of the earth, and digging into the trench a good three inch layer of rotten manure. Let the trenches point south and north, or nearly so as possible, and leave the work to settle for a few weeks, being guided herein by the warm and dry state of the weather, because a cold rainy season would be just as inimical to Indian corn as to cotton crops.

Taking the 1st of July as a suitable time, fill the trenches with fine soil to within three inches of the previous level, stretch a rope and dot in three seeds in a triangle, five or six inches apart, at every foot throughout the length of the rows. Cover them with an inch of earth and press firmly. If the weather become very dry it will be advisable to soak the soil with water two or three times till the plants germinate, and to cover the trenches with mats or leaves during the heat of the sun. Most of the seeds will germinate, but they are liable to accidents, and are often devoured; and as every foot should contain one plant at least, the precaution should be taken to sow a few dozens of seeds in small pots, so that a blank may always be filled up when it has become evident that the seed sown has been destroyed.

When growth appears to be fully established and the plants stand at regular distances, a light hoeing must be made along the trenches; and at the same time the practice of the Peruvians may be safely imitated, particularly in dry seasons, by forming a small ring or basin round the stem of each, sprinkling a little manure in the cavity so as not to touch the stem, and flooding the ground with water.

3. After a time, when the plants obtain a foot in height, three inches of the earth removed from the trenches should be returned, so as nearly to level the ground. In a short time the remaining earth should be brought against the stems, to protect them from the force of high wind.

4. When the male spikes are formed at the summits, it will be beneficial to cover the surface between the rows with an inch of manure or to sprinkle a little liquid manure.

Whatever be the dressing, it should be dug in with the fork, care being taken not to injure the roots and stems. This manuring will cause the foliage to assure a dark rich green, which it will retain during the hottest and driest season.

When the farina from the male spikes shall cease to be discharged, the plants can safely be cut back to within two leaves of the upper ear, and the corn will equally advance to maturity.

My experience proves that as an average December is the harvest month. The plants begin to ripen by losing the green colour, and assuming a pale brown tint; and then the seeds acquire their glossy yellow-cream colour, or pale brown. Birds are very fond of the seed and will penetrate husks till they reach the cob; therefore it is desirable to pull off every one as it becomes ripe.

Whether Indian corn can be profitably introduced, is somewhat questionable. One objection is the lateness of the ripening season and the irregular maturing of the ears. The cultivator will find in the above directions which will guide him in undertaking

an experiment, and it is advisable to make trials in different localities. The grain is truly valuable, is an excellent food for cattle and fowls, and makes good bread with wheat flour.

In India it is often sown as a catch crop before the rabi crop of wheat or barley. It is seen growing to great perfection, says Prof. Wallace, in the neighbourhood of Darjeeling as well as in areas of wider extent in the plains. Along with amarantas it may now be considered the chief food of the hill tribes of the North-Western Himalaya.

Bandaragama. J. A. J. RODRIGO.

GENERAL ITEMS.

We omitted to mention our good fortune in securing a young plant of the Victoria Regia which has been placed in a tank in the School of Agriculture grounds.

It is worthy of record that the culms of a giant bamboo in the Peradeniya Gardens shot up at an astonishing rate in April last year. One of these is said to have grown at the rate of $13\frac{1}{2}$ inches in 24 hours.

The case of a ruminant man is mentioned in the *British Medical Journal* for May. Dr. Leva of Zürich at a meeting in that city exhibited a man of 22 who possessed the power of rumination. From 5 to 30 minutes after each meal the ingested food continued to rise up into the patient's mouth, to be masticated and swallowed again and again, the lad relishing the cuds all through. The process lasts from 70 to 90 minutes. The patient has no control over the process. A careful examination of the pharynx, gullet, and stomach failed to reveal anything abnormal. He states that rumination first appeared about 6 years before his coming under observation, when he had been in the service of a very stingy master. The meals being scarce and the lad's appetite very keen, he acquired the habit of swallowing again the morsels of food which came up into his mouth!

The New B. I. steamer *Alaska* is, according to the *Indian Agriculturist*, to be specially employed in providing steam communication between Negapatam and Colombo—the duration of the voyage, during which 4 or 5 intermediate ports will be touched at, being about a day and a half. The principal trade will be in rice. For coolie emigrants from Indian ports to Colombo the charge will be R4 per head, from Ceylon ports R2 and under.

The trade in ground-nuts is reaching enormous proportions. The estimated value of the ground-nut export during 1889 in India was 122 lakhs of rupees, of which 99 per cent was produced in British India.

Professor Wallace has brought out a revised edition of his "Live Stock of the Farm," and is now engaged on another work on the Rural Economy of Australia and New Zealand, which will very shortly appear.

Much curiosity was aroused at the Nawalapitiya Railway Station during the latter end of May over a tree which had been cut down to some 3 or 4 feet from the ground, from the exposed section of the stem of which there was a continual drip of water. The tree in question was, if we are not mistaken, a *Thunbergia* creeper, with a stem not more than 2 or 3 inches in diameter. According to the Station-master, the dripping had been going on for a fortnight, and showed no signs of ceasing.

A curious case was reported from Mutwal the other day. It seems that a bull commenced bleeding most profusely, and that the blood which issued from the region of the penis continued to flow for more than 24 hours, despite all the efforts of the local Vederalas to stop it by copious draughts. The case coming under the notice of a Medical gentleman in the neighbourhood, he, instantly guessing at the cause of the hemorrhage, syringed a strong solution of salt into the sheath of the penis, when the bleeding almost immediately ceased. The *fons mali*, as may be inferred, was a leech.

The Swanley Horticultural College has for its main object the encouragement and improvement of fruit farming in Great Britain. The principal of this institution is Prof. Frank Cheshire, and among the lecturers is Mr. Cecil Hooper, F.H.A.S., who was a student both at Cirencester and Edinburgh. Mr. Hooper has just written a very able paper on Fruit Farming, the possibility of its extension, and the remuneration to be derived from it, which appears in the last number of the Highland and Agricultural Society's transactions. The Swanley College has an experimental garden of 43 acres attached to it.

It is reported by a correspondent in the *Field* that at Inveradoch, Doone, on the 24th May, a single egg produced two pheasants.

A copy of the *Bosphore Egyptien* to hand gives a sketch of the plan upon which the Agricultural Department and College about to be founded in Egypt are to be established. Mr. Williamson Wallace, the Director, is actively engaged in making himself acquainted with the needs of the country and the means of improvement to be adopted. In a chatty letter received from him from Cairo he says, "I have a lot of hard work—up early in the morning, and off to see the agriculture of the country. The Government have given me a house-boat in which I go about all through Egypt, and have a look at every thing."

The local Governments of India have been asked to send delegates to an Agricultural Conference proposed to be held at Simla in October this year, before the return of Dr. Voelcker to England.

The mummified cats exhumed from an ancient cemetery not far from Cairo—some 20 tons—have, it is said, been brought over to England with the intention of selling them for manure.

Selentropism is the proposed name for the phenomenon of plants turning towards the moon. M. Musset has made careful observations on this subject, and concludes that the stems even

of adult plants undoubtedly turn towards the moon on fine clear nights.

Mr. Kanes-Jackson has lately written a sensational letter to the London *Times* on "The Earth losing Primal Fertility." He asserts that in about a hundred thousand years or so there will be nothing produced on the earth. Not long ago another alarmist endeavoured to show that phosphoric acid at least would be completely exhausted in the soil before long. We have really had enough of these pessimistic theories already.

Hyriyal (හිරියල්) *Arsenicum auripigmentum* is sulphuret of arsenic, and sadilingam (සාදිලිංගම්) is vermilion or mercury sulphide which occurs native as cinnabar the chief ore of mercury. The former is of a reddish-yellow colour and is largely used by the natives in painting, the latter is of a reddish hue and also used by the natives in painting images, &c.—the hyriyal, according to a correspondent, being sprinkled over the vermilion to give it a gloss. Both these substances are sold in the native bazaars.

SCHOOL NEWS.

The Agricultural Improvement Society met on Friday the 11th July for the first time after the holidays, when a paper on the past and present state of paddy cultivation was read by Mr. Estagoepillai. The subject was ably dealt with by the writer, and many interesting points were brought out, and discussed by the members. Mr. Mendis consented to read a paper on the opening out of new land by agriculturists in Ceylon at the next meeting.

We acknowledge with thanks the receipt of a packet of geological specimens from Mr. Theodore Gooneratne of Matara, and a mat of gorgeous design made of the fibre of Niyande (Sansievera Zeylanica) from Mr. E. M. B. Seneviratne.

The results of the half-yearly examinations held in May show that Mr. J. Kodipilly and Mr. Johannes stand at the head of the Senior and Junior classes respectively.

The Seniors are having a few special lectures in Zoology as bearing on Agriculture before the end of the session, which also terminates their connection with the School.

The printed Syllabus of the school is now ready, and is got up with the neatness characteristic of the Government printing press.

During the *Maha* season (July to November) of last year seedlings grown from four seers of *Ma wi* paddy were transplanted. The field was prepared, as has been the case since the introduction of the iron ploughs, by ploughing before the setting in of the regular monsoon rains and leaving the soil exposed to the action of the weather for six weeks before the final preparation of the land for sowing. No manure was applied. The seedlings were planted 6 inches apart each way. The plants tillered and grew very well The crop was reaped towards the end of March last and yielded 9 bushels of paddy.

In May a small plot of ground was planted with Indian Corn. The soil is a free sandy loam. It was twice dug over with the mamotie and thrown into ridges 3 ft. apart. Trenches were made on the top of these ridges and well-rotted cowdung was applied and covered over with soil. The seed was dibbled in on the top of the ridges 4 inches apart. The seed used was procured from the bazaars, but it is hoped that a better variety as the Queensland or Cuzco would be obtained for regular cultivation. The plants came up well for a time, but the very dry weather which prevailed in May and June killed most of them. The plants that survived have grown vigourously and are now flowing three months after planting. The crop was hand hoed once and watered three times. Indian Corn occupies an important place as one of the best food crops, and there is no reason why it should not be more extensively grown. Under ordinary cultivation 200 lb. of grain may be grown per acre on good soils, besides 2½ to 3 tons of straw may be expected per acre. This straw is rich in saccharine matter, and is a valuable food for all kinds of farm-stock. Indian Corn is admirably suited for growing in the intermediate spaces left in cotton cultivation. It only occupies the land for about 4 months, and will pay at least all the expenses and leave the cotton which is sold for profit, thus obviating the usual objection of the unprofitableness of cotton cultivation. Indian Corn may be successfully grown as a fodder crop. About 12 to 13,000 lb. of fodder may be expected per acre, and this fodder is highly prized in America as a food for milch cows. On a previous occasion a small plot of land planted with Indian corn was entirely destroyed by field mice which dug up and ate all the seeds in the night. It is advisable therefore to tar the seed before sowing to preserve it from the attacks of mice, squirrels, &c. If Indian Corn is grown alone, the seed should be sown in rows 3 feet apart at the rate of about 30 lb. per acre. If cultivated with cotton, the rows of corn should be 4 ft. apart, and those of cotton the same distance alternately.